

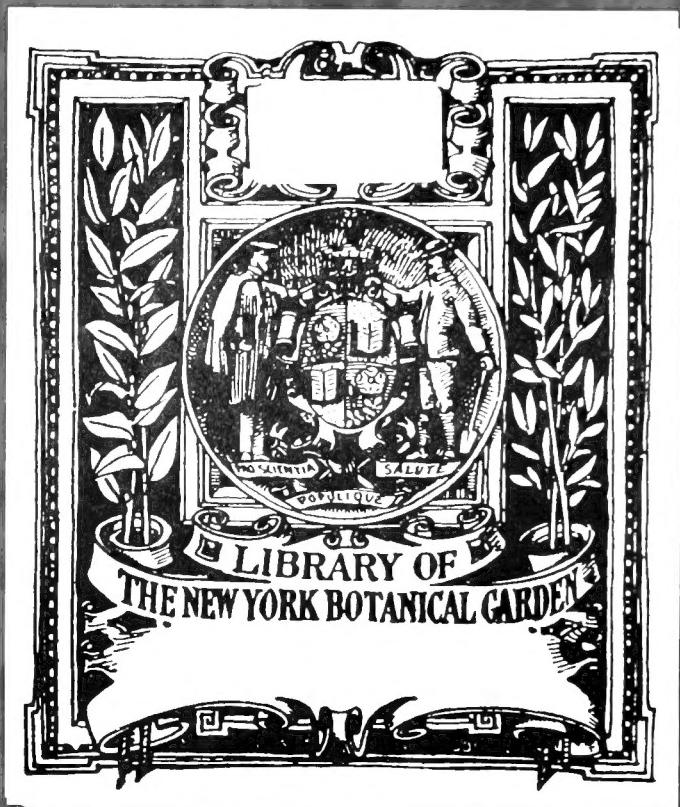
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THE FLORA OF DISKO ISLAND AND THE ADJACENT COAST OF WEST GREENLAND

FROM 66°—71° N. LAT.

WITH REMARKS ON PHYTOGEOGRAPHY, ECOLOGY,
FLOWERING, FRUCTIFICATION AND HIBERNATION

BY

MORTEN P. PORSILD

ASSISTED BY

Å. ERLING PORSILD

ARBEJDER FRA
DEN DANSKE ARKTISKE STATION PAA DISKO Nr. 11

FIRST PART

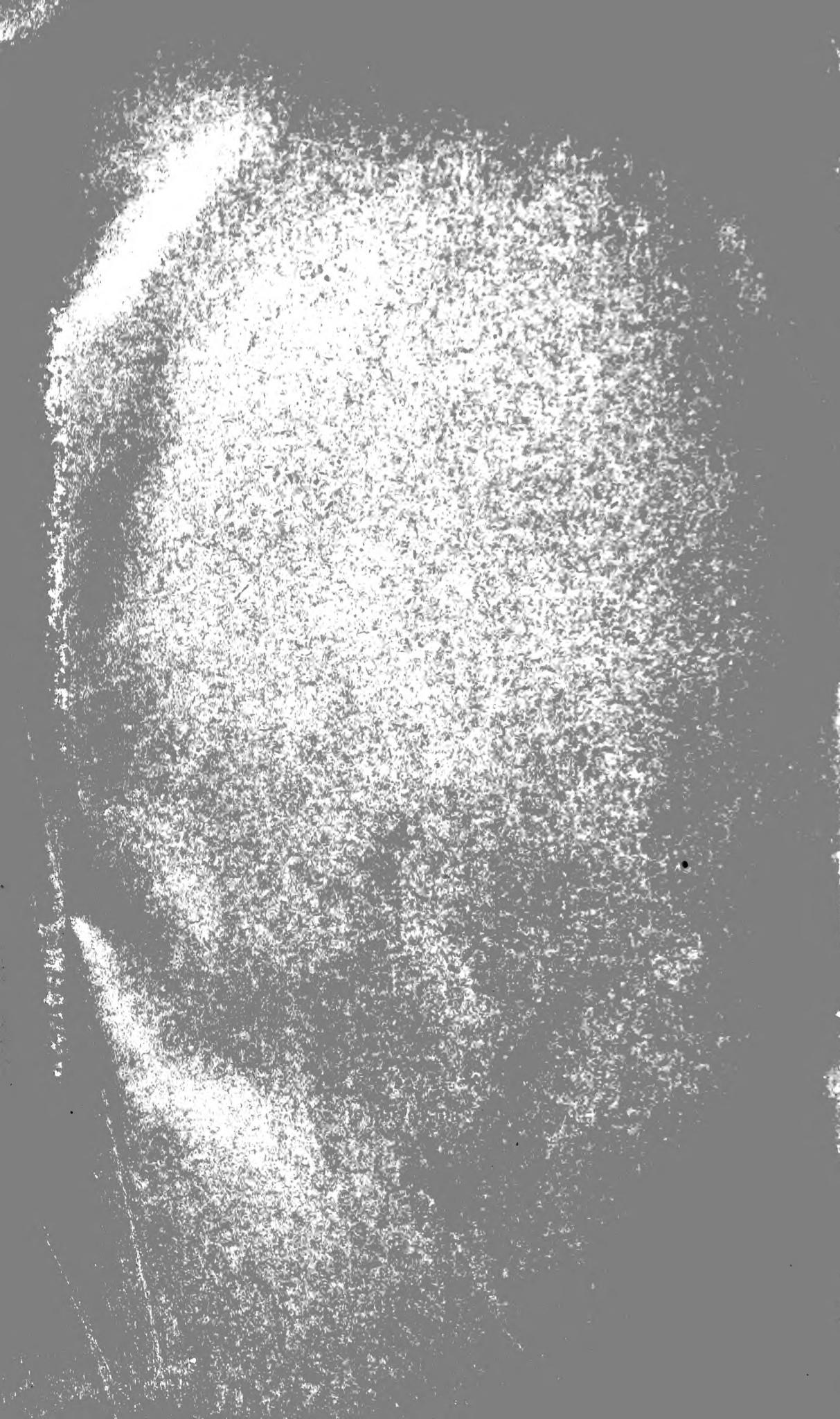
SÆRTRYK AF MEDDELELSEER OM GRØNLAND. LVIII

KØBENHAVN

BIANCO LUNOS BOGTRYKKERI

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PREFACE.

In 1898 I took part in the late Dr. K. J. V. STEENSTRUP's expedition to Disko Island, in which it was my task to study the vegetation in the localities visited by us. In the report of my work (PORSILD: Bidrag 1902) an account was given, for instance p. 229 ff., of the remarkably large southern flora-contingent which is found on the south coast of this island. In 1902 I was dispatched again by the Committee of Geological and Geographical Investigations of Greenland to study the vegetation in the relatively less-known northern part of the island which we did not reach the first time. The result of this journey was proportionately larger owing to my somewhat larger practice and experience, but, nevertheless, it did not modify my impression of South Disko's remarkable floristic peculiarities.

In the following years the results were revised, and in 1905 the report was finished and might have been delivered to the Committee for publication. But then the preparations for the establishment of the Danish Arctic Station on Disko intervened, and, in 1906, when the station was guaranteed, I wanted to take the finished MS. with me to Greenland to supplement it further during my intended stay there. The Committee most kindly agreed to this for which I here offer my sincerest acknowledgement.

Although South Disko, especially the vicinity of Godhavn where I am living at present, is botanically by far the best known locality in Greenland, it became apparent all the same, that it still offered fresh opportunities for research, and this circumstance by itself naturally suggested to me that the adjacent parts of West Greenland might want a further investigation before the floristic characters, which distinguishes them from Disko, were defined more precisely. I have therefore used what time I could spare from other work in the summers of 1906—1918 in such investigations, partly in the island of Disko, partly on the main land to the north and south of Disko. About some of these investigations (Hare Ø, the South- and West coast of the Nügs-

suaq Peninsula from 71° to 73° N. Lat.) I have already published reports (see bibliography), the others are published here for the first time.

In publishing this work, which sums up everything known about the distribution of the higher plants on Disko and the adjacent parts of W. Greenland, I am far from supposing that no new discoveries can be made. The country is so vast, the means of communication so primitive, and the summer so short, that, in spite of all care, I have only succeeded in investigating a small part of it thoroughly; but the obligations of my official work compel me for the time being to finish and to offer to the public my results in as complete a state as circumstances have permitted me.

As an investigation of the flora of Disko was originally my sole aim and always in this connection my chief object, I have throughout the following list kept it by itself. And as the flora of Disko, as already mentioned, has been oftenest examined, a more detailed account of the growth of our knowledge of the flora in a separate arctic region may be justified, as from this conclusions can be drawn, to a certain extent, concerning the greater or lesser reliability of results from other arctic regions when used as a basis for more extensive plant-geographical discussions.

Historical survey of the botanical investigations on the Island of Disko.

OWING to the easy access to the harbour of Godhavn and also on account of the importance of this settlement as the head-quarters of the Royal Inspector of Danish North Greenland, Disko has become the most frequently visited locality of Greenland. Besides the Danish travellers, nearly all North-Polar Expeditions through Davis Strait have anchored here and plants have been collected. With few exceptions however, only the vicinity of the settlement has been studied.

In the following I shall endeavour shortly to characterize the importance of each contribution or, in other words to give the history of our knowledge of the higher plants on Disko, however leaving aside the scanty contributions to the flora of Greenland from the 18th century, as surely very few of them have been brought home from that island.

During his journeys in 1806—13 for the Danish Government, the famous mineralogist C. L. GIESECKE spent much time in the exploring of Disko, where he, at different times, visited the Disko-Fjord, the South Coast, parts of the Vajgat and the North Coast. He also incidentally collected plants, and gave in his article »Greenland«, in Brewsters »The Edinburgh Encyclopædia 1816« a list of plants observed in Greenland, but without any mention of special localities. His diary, of which the main parts were published in 1878 by JOHNSTRUP, also contains numerous notices of plants collected or observed. But GIESECKE's identifications are only partially to be relied upon, and LANGE did not revise the collection of GIESECKE till 1887 (see below).

The richest collections of plants ever brought home from West Greenland by one collector, were made by JENS VAHL, who, sent by our Government, spent 8 years in Greenland and who, during the years 1833—36 visited several times the neighbourhood of Godhavn. Unfortunately this able and thoroughly scientifically trained botanist

never came to publish his results; he only distributed sets of duplicates with printed labels, giving the distribution of the vascular plants, from 60° to $72^{\circ}48'$ n. Lat. At his death in 1854 he left, besides extensive diaries, a nearly completed MS. with full descriptions of all plants known to him as occurring in Greenland, but these MSS., that together with the collections of VAHL are in the possession of the Botanic Garden at Copenhagen, have never been published. Only some new forms, found by VAHL have been incorporated in the *Flora Danica*^a together with figures and short diagnoses of them.

In 1857 JOH. LANGE gave a list of plants of Danish Greenland as an appendix to H. RINK: Gronland, statistisk og geographisk beskrevet vol. II¹. The list is chiefly based upon the collections of VAHL and RINK and on the information given by the former on his written and printed labels. Special localities are only stated for the rarer species, the distribution of the common ones is stated by indicating the parallels of their southern and northern limit, as found by VAHL.

According to this list, VAHL has found on Disco between 135 and 155 species². Amongst the species here recorded from Disco one statement seems to be erroneous, viz. *Anemone Richardsoni* (see the notes for this species in my list below).

During PENNY's voyage some plants were gathered by P. C. SUTHERLAND; a set of them, named by W. J. HOOKER was given to J. DICKIE, who published them together with a small collection brought home by INGLEFIELD (see his book: A Summer Search for Sir John Franklin 1853 p. 135). From Disko 11 species are recorded.

During BELCHER's expedition a collection of plants was made by LYALL; they were determined and published by J. D. HOOKER (Journal of the Proc. of the Linn. Soc. Botany vol. I 1857 p. 114) who records about 56 species from Disko. Of the rarer species, *Habenaria albida* deserves special mention, because up to that date it had not been found so far north. The following statements are without doubt erroneous: *Larbrea uliginosa* (= *Stellaria longipes*), *Gnaphalium sylvaticum* (= *Gn. norvegicum*), *Arenaria rubra* (= ?).

On KANE's voyages plants were collected at various places in Danish Greenland as well as near Smith Sound. In the list given by DURAND (Appendix No. XVIII to E. K. KANE: Arctic Exploration: The Second

^a Reprinted in the German and English editions of this work.

² The number of species named in the following notes is always based upon the limitation of the species accepted by me; the numbers given in the original papers are therefore often somewhat altered here.

Grinnell Expedition etc. vol. II Philadelphia and London 1856) some 25 species are recorded from Disko. However it has been pointed out by several authors¹ that some confusion must have arisen as to the statement of provenience of the different specimens, southern plants being recorded from northern localities, the latitude of the stations not given exactly etc. To an error in the opposite direction the record of *Saxifraga flagellaris* from Disko, is due. As no erroneous determination of such an easily recognizable high-arctic species seems possible, the specimen in question must have been collected at some station near Smith Sound. As to the described new variety of *Ranunculus aquatilis* I shall refer the reader to my list, and leaving the *Drabas* out of discussion, the remaining species from Disko are all very common plants.

During whaling cruises 1856—61 J. TAYLOR several times visited the southern coast of Disko and collected plants there. He published in 1862 a list of his collections from both sides of Davis Strait and from Baffins Bay. (Trans. Bot. Society of Edinburg vol. XVI p. 76—87). Besides 21 very common species of which no special localities are named, 19 species are recorded especially from Disko. Two of his statements are erroneous, viz. *Andromeda polifolia* and *Colpodium latifolium* of which the author says that they are »common on both sides« (see my list No. 32 and remarks on Andromeda).

Dr. WALKER, surgeon to M' CLINTOCK's expedition, collected plants from the following places in Danish West Greenland: Frederikshaab, Godthaab, Disko (ø: Godhavn), Fiskemær and Upernivik. The locality »Fiskemær« is unknown to me; although its position is stated to be north of the polar circle, I should be inclined to believe that the name is a misreading of that of the settlement of Fiskernæs at 63°5'. And this supposition is supported also by the record of *Potentilla tridentata* and *Thymus Serpyllum* from »Fiskemær«, both being common in South Greenland, but very scarce north of the polar circle.

The list published by J. D. HOOKER (Journ. of the Proc. of the Linn. Soc. Botany vol. V 1861 p. 79) records some 47 species found on Disko, of which: *Poa nemoralis* and *Equisetum silvaticum* are especially interesting, their occurrence on Disko not having been verified by later collectors.

ROB. BROWN (of Campster) published 1868 his well-known »Flora Discoana« (Trans. Bot. Soc. Edinburg vol. IX) and mentions about

¹ for instance see A. J. MALMGREN: Botaniska Notitser 1865 p. 169; A. G. NATHORST: Öfv. K. Vet. Ak. Förh. 1884 Nr. 1.

22 species collected by himself near Godhavn or on the Vajgat shore near Únartoq and Qutdligssat; only one of them needs especial mention, viz. *Potentilla tridentata* from Lyngmarken; as it has not been found here by the numerous other botanists who have visited this locality, the statement seems erroneous¹. Far more interesting are the instructive descriptions given by this author of the general character of the vegetation around Godhavn.

Sv. BERGGREN, member of NORDENSKIÖLD's expedition of 1870, collected plants in the vicinity of Godhavn and gave in 1871 (Öfv. K. Vet. Ak. Förh. 1871 No. 7) an excellent description of the vegetation of the localities visited by him. A systematically arranged list was not published, but in the above named paper, the following species are for the first time recorded from Disko: *Dryopteris Linnaeana*, *Calamogrostis neglecta*, *Carex capitata*, *Juncus trifidus*, *Luzula nivalis*, *Sagina saginoides*, *Melandrium apetalum*, *Draba arctica*, *Ranunculus sulfuratus*, *Epilobium palustre*, *Pirola secunda*.

In 1871 TH. M. FRIES made still more valuable collections. He not only collected on the south coast, but he also visited the fjords on the western side and the then botanically unknown north and Vajgat coast of Disko. As far as I am aware, FRIES never published his vascular plants from Greenland himself, but they have been incorporated in the »Conspectus« of LANGE 1880 and in its first supplements of 1889.

Of plants collected by FRIES, the following were new to the flora of Disko: *Potamogeton filiformis*, *Calamogrostis purpurascens*, *Dupontia Fisheri*, *Poa abbreviata*, *Puccinellia Vahliana*, *Puccinellia angustata*, *Agropyrum violaceum*, *Cobresia Bellardi*, *Cobresia bipartita*, *Carex incurva*, *Carex pedata*, *Carex capillaris*, *Corallorrhiza trifida*, *Minuartia stricta*, *Arabis arenicola*, *A. Holboelli*, *Braya purpurascens*, *Draba incana*, *Lesquerella arctica*, *Potentilla Friesiana*, *Euphrasia arctica*, *Taraxacum phymatocarpum*, *T. groenlandicum*.

H. C. HART, naturalist to the British Polar-Expedition of 1875—76 made rich collections of plants on the south coast of Disko, during a week's stay here. In his paper (Journal of Botany, New Series vol. IX 1880) he gives p. 54—55 a short account of the general character of the vegetation and in his list he records some 87² species from this

¹ After this was written, H. G. SIMMONS has shown l. c. p. 470 that the specimens of BROWN are *Sibbaldia procumbens* with a small fragment of *P. tridentata*. But as BROWN has collected at Christiansaab, where the latter species occurs, it seems probable to me, that the uniting of the two plants is due to some confusion.

² According to my enumeration; HART himself gives the number as 119 species.

island. Of the most interesting he emphasizes the following, of which he says, that they have not previously been found on Disko:

Ranunculus affinis, (this statement seems very doubtful to me, it is according to my opinion nothing but a form of *R. nivalis*).

Draba alpina var. *glabra*.

Cerastium latifolium, without doubt a mistake for a form of *C. alpinum*.

Gnaphalium sylvaticum (already reported by HOOKER as collected by LYALL); this species has never been found in Greenland, and HART must have mistaken a form of *Gn. norregicum* for it, although he also mentions this species¹.

Habenaria albida Br. Of this HART says: »Not recorded north of 64°14' by LANGE, nor noticed by BROWN, nor it is given in WALKER's plants of Greenland, nor in DURAND's list of KANE's plants«. All these statements are quite true, but as we have seen, this plant was already 1857 recorded from Disco by HOOKER under the name of *Peristylus albidus* (collected by LYALL).

Listera cordata, this was really found many years before on Disko by HOLBOELL, but the record of it was not published when HART wrote his paper.

Dryopteris Linnaeana was already found here in 1870 and recorded by BERGGREN in 1871.

Of other Disko plants in HART's list, the following deserve special mention:

Potentilla tridentata »common from Englishman's Bay to Point Lakse«. This statement is most surprising, as no other botanist has found it here, but H. G. SIMMONS has now informed us, (l. c. p. 470) that the plants thus determined by HART are really *Sibbaldia procumbens*.

Andromeda polifolia; the record of this very rare southern plant must also be due to some mistake (? *Loiseleuria procumbens*). According to SIMMONS (l. c. 472) no specimens are to be found amongst HART's collections.

Rumex Acetosella, is sometimes found at Godhavn but as an introduced weed.

Arctagrostis latifolia; according to my experience this statement is erroneous, as this high-arctic species has not been found by other collectors on the south coast of Disko, having its southern limit in the Nordfjord (see my list).

L. KUMLIEN, the naturalist to the Howgate Expedition of 1877—78, paid a visit of 3 weeks to south Disko: Godhavn and Disko-Fjord in

¹ H. G. SIMMONS has come to the same conclusion and he reports that no specimens of *Gn. sylvaticum* occur in the collections of HART in the British Museum or at Kew. (l. c. 472).

1879. The flowering plants were collected by him and determined by ASA GRAY, and a list of them is published in Bull. U. S. Nat. Mus. No. 15, Washington 1879. No special localities are given. Amongst the plants mentioned from Disko, the most interesting is *Arctostaphylos alpina*.

JOH. LANGE published in 1880 the first part of his excellent *Conspectus flórae Groenlandiae* (Meddelelser om Grönland III) in which he has put together all records of Greenland plants known up to that time and chiefly based his results on his own revision of the large collections in the museum at Copenhagen. Here also are mentioned for the first time some small collections made by several Danish officials and ladies and sent to Copenhagen. For Disko the whole number of vascular plants recorded by LANGE amounts to about 175 species.

A. BERLIN and A. C. NATHORST, both participating in NORDENSKIÖLD's expedition of 1883, collected plants on Disko. In his paper BERLIN enumerates about 44 species from the vicinity of Godhavn (Öfv. K. Vet. Ak. Förh. 1884 No. 7) whilst NATHORST records 21 species from the Vajgat coast. (Öfv. K. Vet. Ak. 1884 No. 1).

In both pamphlets several interesting varieties and forms are mentioned.

EUG. WARMING, visited during his journey to Greenland in 1884 the south coast of Disko and made, assisted by THEO. HOLM, rich collections here. Some of their most interesting gatherings are mentioned in a paper of WARMING's in Meddelelser om Grönland VI 1886, (for the rest see the papers by HOLM and LANGE quoted below).

The main botanical results of the journey was the classical treatise of WARMING: Om Grönlands Vegetation (Medd. om Grönland XII 1887 with resumé in French ibid. (see also ENGLER's Jahrbücher).

In this work are also given detailed accounts of some stations on Disko.

THEO. HOLM and L. KOLDERUP ROSENVINGE travelled in West Greenland in 1886 and also collected on the southeast of Disko. HOLM published the results of his two journeys in ENGLER's Jahrbücher VIII p. 283 ff., where some 121 species are mentioned from Disko, amongst them the very rare *Alchimilla alpina*, *Rodiola rosea* and *Carex gynocrates* new to Disko.

The new localities found by ROSENVINGE, who was chiefly engaged in studies on Algae, are incorporated in the following paper. New to Disko are *Sedum villosum*.

In 1887 JOH. LANGE published a supplement to his *Conspectus* (Medd. om Grönland III, 2) in which several new localities are

mentioned, chiefly based upon collections made by Danish travellers and officials in Greenland, but partly compiled from papers of British and Swedish authors.

N. HARTZ visited in 1890 a few localities on the Vajgat coast and in the neighbourhood of Mudderbugt and gave in 1894 (Medd. om Grönland XV) an account of the vegetation of those places. Of his most interesting gatherings *Potentilla Ranunculus*, *Pirola minor*, and *Callitricha verna*, were new to Disko, perhaps also *Stellaria borealis*. For the remainder of his gatherings see the following.

L. KOLDERUP ROSENVINGE published in 1892 (Medd. om Grl. III cont.) a thoroughly revised list of the plants of Greenland, as a second supplement to LANGE's Conspectus. Of Disko plants it contains most of HOLM's and all HARTZ' gatherings.

W. E. MEEHAN collected in 1892, during an expedition to PEARY's winter-quarters, some plants near Godhavn, and published in 1893 a list of them, as well as of some plants collected by Dr. BURCK in the same locality (Proc. Acad. Nat. Sci. Philadelphia 1893). Although in this list special localities are wanting, I suppose all the same that about 50—60 of his species may have been collected here.

MEEHAN records, without doubt erroneously, the following interesting of his plants from Disko.

Potentilla tridentata; ? = *Sibbaldia* (see above TAYLOR and HART).

Matricaria inodora as a garden weed; perhaps this is correct; only I may point out, that *M. Chamomilla* is quite common as a weed near the settlement.

Pedicularis capitata } probably = *P. flammea*.
Pedicularis versicolor }

It is evident to every one with any knowledge of the flora of Greenland and it is shown by different authors (for instance by THEO. HOLM (ibid. 1895 p. 543 ff.), MEEHAN's paper is totally uncritical and unscientific, and no credit can be given to his statements, so long as they are not verified by others. Unfortunately Mr. HOLM only saw part of his collections.

H. E. WETHERILL collected, during the PEARY Auxiliary Expedition of 1894 plants, partly near Godhavn, partly on the little-studied N.W. coast of Disko. A list was made by the staff of the botanical department of Harvard University (Bull. No. 5 of the Geogr. Club. of Philadelphia). From Disko 35 species are recorded, amongst which *Deschampsia alpina* is new to that island, and *Raphanus Raphanistrum*, a garden weed, is new to Greenland.

In 1896 L. KOLDERUP ROSENVINGE published a list of new records made since his paper of 1892. As far as Disko is concerned, some most interesting gatherings by the Rev. P. H. SØRENSEN, partly from Godhavn, partly from the Disko fjord are incorporated with it; also some collections made by M. TRAUSTEDT.

A remarkable number of the Rev. SØRENSEN's findings are made outside the ordinary area of distribution. All the determinations of these findings have been verified by ROSENVINGE, and the labels bear quite correct statements of finding-place, date, etc. But all the same I do think that some of them ought to be questioned, because, during several years, I have made an unavailing search for the plants in those localities within my reach, as for instance, *Cornus suecica*, a very conspicuous species which is recorded both from Egedesminde and Godhavn, even with ripe fruit. Besides, we meet with some quite improbable statements in the material collected by SØRENSEN. *Potamogeton gramineus*, for instance, being recorded from Røde Elv near Godhavn. But Røde Elv is a cold glacier torrent in which no *Potamogeton* is able to grow, least of all this purely temperate species, which otherwise is known from 60°—61° only, and occasionally up to 67°.

As the Rev. SØRENSEN lived during those years when he formed his collection, sometimes at Godthaab, about 64°, and sometimes at Disko-Bay I cannot get rid of the idea that his collections from the various places have somehow got mixed, which often happens, I am sorry to say, in the case of amateurs who fail to see the wide bearing of their statements. Therefore I cannot take these statements, into consideration, till they have been confirmed by more recent discoveries.

A. W. ROWLEE and K. M. WIEGAND published 1897 in (Botanical Gazette XXVI 2 p. 417—26) a list of plants collected by the CORNELL-Party of the PEARY expedition of 1896. From the vicinity of Godhavn 67 species are named, of which a few are rather rare, all however having been previously found here.

CHR. KRUUSE visited in 1897 during a botanical journey to West Greenland, the neighbourhood of Godhavn and gave in 1898 some accounts of the vegetation and of the plants noticed by him (Medd. om Grl. XIV p. 348 ff.).

MORTEN P. PORSILD visited Disko in 1898 and collected on the south coast, the Vajgat coast and some branches of the Disko-Fjord and in some valleys leading to the interior viz. the Kùgånguaq valley, the Kvan-valley behind Ujaragsugssuk. Of my collections, the *Potentillas* have been studied by P. A. RYDBERG (Bull. of the Torr. bot. Club 28,

1901). Of the vegetation I published an account in Medd. om Grl. XXV; for the remaining collections see below.

HERM. G. SIMMONS, botanist to the second Norwegian »Fram« Expedition in 1898, made an excursion to Lyngmarken near Godhavn. In a preliminary paper (Nyt Magazin for Naturvidenskaberne B. '41, 1903 p. 223) he mentions some of the plants noticed.

THEO. HOLM published in 1900 a list of plants collected by the PEARY Expedition of 1897 (Bull. of the Torr. bot. Cl. 27, p. 65—68); 2 species are mentioned from Godhavn.

MORTEN P. PORSILD, during a summer trip to West Greenland in 1902, made a boat excursion round Disko and collected plants, not only on the coast round the island, but in all the fjords and on the western sides and at several stations in the interior of the northwestern part also.

Since my moving to Greenland in 1906 I have, partly alone, partly together with visitors to the Danish Arctic Station: H. BACHMANN of Lucerne, M. RIKLI of Zürich, W. JOST of Berne, LAUGE KOCH of Copenhagen, TH. WULFF of Stockholm, W. E. EKBLAW of Urbana, Ill. made numerous excursions on Disko, to the southern coast as well to the others, to the fjords and in the interior. On most of those excursions I was assisted by one or by both of my two sons: THORBJÖRN and ERLING PORSILD, who besides collected on several trips for themselves. Also my former assistant Mr. J. N. NYGAARD made several gatherings on the south coast.

I have found on Disko Island and, as far as I am aware for the first time:

Potamogeton Friesii (new to Greenland!), *Alopecurus aristulatus*, *Arctagrostis latifolia* (cfr. TAYLOR and HART), *Deschampsia caespitosa* var. *pumila*, *Puccinellia tenella*, *Heleocharis acicularis* v. *submersa*, *Carex canescens*, *Ranunculus pancistamineus* v. *eradicatus*, *R. p.* var. *divaricatus* (new to Greenland!), *R. reptans*, *Draba aurea*, *Saxifraga aizoides*, *Potentilla tridentata* (cfr. TAYLOR, HART), *Callitricha autumnalis*, *Gentiana aurea*, *Plantago decipiens*, *Linnaca borealis*, *Antennaria intermedia*, *Hieracium groenlandicum* (together with Prof. M. RIKLI).

J. N. NYGAARD was the first to find:

Calamogrostis hyperborea.

THORBJÖRN PORSILD was the first to find:

Carex rufina, *Pirola minor* \times *grandifolia* (new to Greenland!).

ERLING PORSILD was the first to find:
Botrychium lanceolatum.

This detailed enumeration shows clearly, that even from the best and most frequently investigated localities some new species could still be found and that consequently from lesser investigated areas the discovery of several species may still be expected.

The botanical investigation of the mainland of West Greenland between 71° and 66° has not been nearly so thorough as that of Disko Island but, nevertheless, better than on several other parts of the coast. My own excursions here extend from the Itivdlefjord at 66°30' N-Lat. to the Laksefjord at 72°30', and they comprise especially:

- 1) The fjords in the Holsteinborg district, 1914.
- 2) Nordre Strømfjord, 1918.
- 3) The district of Egedesminde 1912, 1914, 1918.
- 4) The region about South East Bay 1917.
- 5) The land between the icefjords of Jakobshavn and Torssukáatak 1915.
- 6) The south and west coasts of Nûgssuaq Peninsula 1902, 1908, 1909, 1911, 1913.
- 7) Hare Island 1909.
- 8) The coast and fjords between 71° and 72°30' N-Lat., 1911.

THORBJÖRN PORSILD took part in the collecting work of No. 7 and 8 and on the journeys of 1911 and 1913 under No. 6, whilst ERLING PORSILD was my partner on the journeys No. 1, 2 and 3.

In the following is given an enumeration of the localities, where more or less extensive botanical collections have been made. For the names of the collectors I have used the following abbreviations. The mark ! behind a name denotes specimens seen by me.

Bg.	= Sv. Berggren.	Htz.	= N. Hartz.
Bl.	= A. Berlin.	Th. H.	= Theo. Holm.
R. Br.	= Rob. Brown.	Jens.	= J. A. D. Jensen (Bildsoe).
Engell	= M. C. Engell.	Jost.	= W. Jost.
Fr.	= Th. Fries.	Korn.	= A. Kornerup.
Hart.	= H. Ch. Hart.	Kr.	= Kruuse.

Nath.	= A. G. Nathorst.	Ros.	= L. Kolderup Rosenvinge.
Nord.	= A. E. Nordenskiöld.	R. & W.	= Rowlee and Wiegand.
A. P. O	= A. P. Olsen.	Syl.	= Sylow.
Pf.	= Pfaff.	Sor.	= P. H. Sorensen (Vibæk).
P.	= Morten P. Porsild.	T.	= Taylor.
E. P.	= A. Erling Porsild.	V.	= J. Vahl.
Th. P.	= Thorbjørn Porsild.	Vh.	= Vanhöffen.
P. & E.	= Erling & Morten P. Porsild.	W.	= Eug. Warming.
Rink.	= H. Rink.	W. & H.	= Warming and Holm.

H. H. = Herbarium Hauniensis, i. e.: the Arctic collections of the Botanical Museum at Copenhagen.

Hare Island. T. between 1856 and 1861; Nath. 1883; P. 1909.

Nûgssuaq Peninsula, Westcoast. Basalt and tufa.

Nûgssuaq Udsted 70°41' V. 1836; Th. P. & P., 1911, P. 1913.

Big Valley from mouth along the north side of the river from Marrait to about 53°10' W Long. P. 1902.

Marrait, Niaqornârssuk, 70°28', P. 1902 & 1908.

Nûgssaq, Ivilik, Igdlularssuit ab. 70°25' V. 1836 P. 1902 & 1913.

Qingmerssorfik, Aussivik, Igpiârssuk ab. 70°23' P. 1902 & 1913.

Niaqornârssuk 70°22' P. 1909 & 1913.

Nûgssuaq Peninsula coast of Waygat. Carboniferous sandstone and shales interrupted by basaltic veins and by superimposed basaltic beds.

Alianaitsúnguaq, 70°21' P. 1909.

Nûk, Nûk qiterdleq, 70°20' P. 1909.

Atâ, Kugssinerssuaq, 70° 16—17', Rink, Schuchert & White 1897, P. 1908, 1909 & 1913.

Pâtut 70°13' Nath. 1883, Htz. 1890, P. 1909 & 13.

Manik 70°9', Kingitoq 70°8', V. 1836, Htz. 1890, P. 1913.

Qardlúnguaq 70°4', Htz. 1890.

Atanikerdluk 70°2' R. Br. 1867, Nordensk. 1870; Th. Fr. 1871
Nath. 1883; Htz. 1890; Schuchert & White 1897; P. 1909 & 13.

Nûgssuaq Peninsula, south coast, gneissic district north of Torsukâtak Icefjord.

Naujat, Sarqaq 70°0' V. 1835 & 36; R. Br. 1867; Bg. 1870; Th. Fr. 1871; Htz. 1890; P. 1913; E. P. 1913.

Qitingusait 70°8' V. 1836.

Qeqertaq 70°0' Bg. 1870; Sylow 1883; E. P. 1913.

Valley near Majorqarssuatsiaq 70°29' Bg. 1870.

Land between Torsukátak and Jakobshavn Ieefjords.

- Ulússat 69°52' Sylow 1883.
 Igdlutalik, Qeqertakaysaq 69°53' P. 1915.
 Arsivik, Igdluuarssuit 69°50' P. 1915.
 Eqe 69°44' P. 1913 & 15; Jost 1912 & 13.
 Atá 69°43' Th. P. 1913; P. 1915.
 Ritenbenk, Kangeq 69°43' V. 1836; R. Br. 1867; Bg. 1870; Sylow
 1883; Htz. 1890; Kr. 1897.
 Klokkerhuk 69°32' V. 1835.
 Pákitsoq, Hordleq, Berggrens Havn 69°28' V. 1833 & 35 & 36;
 R. Br. 1867; Bg. 1870; Sylow 1883; P. 1915.
 Rode Bay 69°20' V. 1836; R. Br. 1867; Sør.
 Brede Bugt 69°17' P. 1915.
 Jakobshavn, Sermermiut 69°13' V. 1833 & 35; R. Br. 1867; Bg.
 1870; W. & H. 1884; Sør.; P. 1915—18. A. P. O.
 Imilik 69°11' Sør. Th. P. 1918.
 Naydhuarssuk 69°13' W. & H. 1884.

From Jakobshavns Ieefjord to Sydostbugt.

- Claushavn, Sandbugt, Tasiussaq, Nunattap tasia, ca. 69°5' V.
 1835; R. Br. 1867; Bg. 1870; Engell 1902.
 Lerbugt 69°0' Bg. 1870; Htz. 1890.
 Christiansaab, Kangersuneq 68°48' V. 1835; R. Br. 1867; Bg.
 1870; Sylow 1883; W. & H. 1884; Htz. 1890; P. 1917.
 Niaqornaq, Niaqornárssuk 68°43' V. 1835.
 Islets in the Sydostbugt, Akugdlit, ca. 68°40' Bg. 1870; Htz. 1890;
 P. 1917.
 Ikamiut 68°38' Bl. 1883; Kr. 1897.
 Orpigssuit, 68°36' V. 1835; Htz. 1890; Engell 1902.
 Sarpiussat, south coast of Sydostbugt, ab. 68°32' Bg. 1870; P. 1917.

Archipelago of Egedesminde.

- Kronprinsens Ejland 69°0' V. 1883; Kr. 1897.
 Hunde Ejland 68°52' Sør. Kr. 1897; P. several times.
 Kullen, Manítsoq, Isuamiut ab. 68°45' Bl. 1883; Kr. 1897; P. 1918.
 Egedesminde and environs, Akúnáq, Tuluvartalik, ab. 68°43' E. P.
 1918 north side of Sarqardlit island V. 1883; R. Br. 1867; Bl.
 1883; W. & H. 1884; Htz. 1890; Sør.; P. several times.
 Manermiut, south side of Sarqardlit island, Nivâq ab. 68°35' Bg.
 1870; Kr. 1890; P. & E. 1918.
 Islands in the Bay of Nivâq, northern part, 68°30'—35' Kr. 1897;
 P. & E. 1818.

Islands in the Bay of Nivâq, southern part, $68^{\circ}25'$ — $30'$ Kr. 1897;

P. & E. 1918.

Kangâtsiaq and environs $68^{\circ}18'$ Bg. 1870; Bl. 1883; Kr. 1897.

Simiutarssuaq and other islands in the mouth of Arfersiorfik $68^{\circ}10'$.
Alângorssuaq and Tugtulik in the mouth of Ataneq fjord $68^{\circ}5'$

Kr. 1897.

Agto and other islands hereabout ca. $67^{\circ}58'$ Kr. 1897; P. & E.
1914 & 18.

Kangeq, s. of Agto $67^{\circ}48'$ E. P. 1918.

Interior of Egedesminde District.

Northwest coast of Naternaq $68^{\circ}25'$, fjord s. of Nângissat $68^{\circ}30'$
P. & E. 1918.

Isthmus to Tasiussarssuaq ca. $68^{\circ}32'$. Bg. 1870; Bl. 1883; P. 1917.

Tasiussarssuaq, Sofias harbour ca. $68^{\circ}25'$. Bg. 1870; Bl. 1883.

Aulatsivik and environs ca. $68^{\circ}10'$ Bg. 1870; Kr. 1897.

Ataneq Fj. ca. $68^{\circ}0'$ P. & E. 1914.

Kangerdluarssuk, east of Agto $67^{\circ}59'$ E. P. 1918.

Northern Stromfjord.

Taserlik, $67^{\circ}26'$ P. & E. 1918.

Eqluarssuit, $67^{\circ}36'$, P. & E. and north coast opposite P. & E.
1918.

Tiggaq, $67^{\circ}38'$, Sor.

Ipiutarssuaq, $67^{\circ}43'$, Korn. 1879; P. & E. 1918.

Southern branch ab. $67^{\circ}30'$, Jens. & Korn. 1879.

Branch from Ipiutarssuaq — to the rapids of Sarfarssuaq $67^{\circ}43'$
— $48'$ Korn. 1879; P. & E. 1918.

Ugssuit, $67^{\circ}46'$ — $50'$ P. & E. 1918.

Qarsorsaq, $67^{\circ}53'$ P. & E. 1918.

Nuerssorfit ab. $67^{\circ}55'$ P. & E. 1918.

Land between Northern Stromfjord and Holsteinborg.

Tatsip atâ $67^{\circ}20'$ W. & H. 1884; Htz. 1890.

Kôrorssuaq in N. Isortoq $67^{\circ}15'$ V. 1832, Ros. 1886.

Kangârssuk, $67^{\circ}3'$ V. 1832.

N. Kangerdluarssuk $67^{\circ}4'$ Ros. 1886.

S. Kangerdluarssuk ca. $67^{\circ}0'$ W. & H. 1884; Ros. 1886.

Land between 66° — 67° , Holsteinborg and fjords.

Holsteinborg, Præstefjeld, Kællingehætten, $66^{\circ}55'$ V. 1832—33;
Korn. 1879; W. & H. 1884; Ros. 1886; Htz. 1889 & 90; P.
& E. 1914.

- Kerrortussoq, 66° 55' W. & H. 1884.
 Sarfänguaq, 66° 53' W. & H. 1884; E. P. 1914.
 Maligiaq, 66° 56' W. & H. 1884; P. & E. 1914.
 Itivneq-valley 66° 57'- 67° 2', V. 1832; W. & H. 1884; P. & E. 1914.
 Ikertóq fjord 66° 47', V.
 Naujarssuit, fjord of Qeqertalik 66° 45', Brummerstedt, P. & E. 1914.
 Head of Itiydleq-Fjord of 66° 30', P. & E. 1914.
 Itiydlinguaq 66° 29' Jens. 1884; P. & E. 1914.
 Head of S. Stromfjord, Nakajanga, Umiavik and environs ca. 66° 50' Jens. 1884.

The above mentioned list shows that the botanically examined localities are situated rather close to the outer coast, while the interior of the large ice-free territory from 66° 5' up to the Disco Bay still is quite insufficiently investigated. The numerous discoveries of rare plants, often far from their ordinary area of distribution, which have especially been made in the southern part of the country, show that large results may still be looked forward to here. And as this territory in geographical geological respect, too, may probably be reckoned among the most interesting in Greenland, both a closer investigation and a better and more detailed charting would seem to be one of the most remunerative tasks of the future. May they come soon!

Remarks to the following catalogue of plants.

Determination of the material.

I determined the results of my first journey at Copenhagen where I had free access to the Arctic Herbarium in the Botanical Museum. Besides, great assistance was given me by Prof. Dr. C. H. OSTENFELD, the then inspector of the Museum. After my departure for Greenland numerous critical questions have been sent Dr. OSTENFELD for decision. Some plants have been determined by Prof. C. RAUNKJER, Copenhagen (*Potamogeton mucronatus*), Dr. H. DAHLSTEDT, Stockholm (*Taraxacum*, *Hieracium*), and Dr. P. A. RYDBERG, New York (*Potentilla*). My warmest thanks are due to these men, whose names I have mentioned, for the help given to me. Where in the following list the determination is due solely to their judgement, this is expressly mentioned, where nothing is stated, the responsibility of the determination rests on me.

Nomenclature. As I have but a limited access to literature here, especially to the older one, and none at all to any larger collections, I am absolutely debarred from having any independent opinion as to the question of nomenclature. I have therefore largely made use of the nomenclature of the following works:

- 1) C. H. OSTENFELD: *Flora arctica I.* 1902 (NB! published before the Vienna Rules of 1905).
- 2) Diverse works by H. G. SIMMONS especially: *The Vascular Plants in the Flora of Ellesmereland* 1906. *Flowering Plants and Ferns of North Western Greenland*, 1909, and *Survey of the Pityogeography of the Arctic American Archipelago* 1913.
- 3) B. L. ROBINSON and M. L. FERNALD: *Handbook of Flowering Plants and Ferns.* (Gray's new Manual 7th edition 1908).
- 4) C. A. M. LINDMAN: *Svensk Fanerogamflora* Stockholm 1918.

The distribution of the plants: This section is written by ERLING PORSILD, revised and finally prepared for publication by M. P. PORSILD. Besides literature, our own collections and our excursion diaries have been resorted to, which especially contain information about the occurrence of the species common to the region concerned. As to rarer species we have mentioned the name of the finder, but in those cases when the species is fairly common we have omitted this and replaced it by our general indications of frequency. Our special aim has been to state, with greater accuracy than that used in LANGE's *Conspectus Fl. Gr.*, the character of the natural habitats of the plants. We have especially proceeded on the lines laid down by L. KOLDERUP ROSENVINGE in „*Andet Tillaeg*“ and by N. HARTZ in „*Fanerogamer og Karkryptogamer fra Nordostgronland*“.

The vertical distribution we have tried to express in general remarks, having dispensed with statements of the actual numbers in hand. In fact they seem to us still far too few and casual and hardly entitled to be published. Generally we think that a true arctic plant, what we in the following call a northern or widely distributed type, has no limit of elevation upwards, but on the other hand, it frequently has a limit of elevation downwards near the southern limit of its horizontal distribution, which, of course, does not prevent it from occurring occasionally below its continuous distribution, especially in places where fresh moraine advances far down in the lowland, or where rivers and mountain streams may carry it right down to the coast. The absence of certain arctic species in the lowland are hardly due to climatic conditions, the cause being the competition between the species.

Far otherwise the plants which we denote as southern types.

They are almost without any exception lowland plants at the northern limit of their horizontal distribution.

Our use of the expression lowland is relative, somewhat varying according to the locality. On the north side of big massives we denote as lowland a level as low as a couple of hundred meters above sea-level, on the south side and in protected places in the interior up to 400-500, occasionally even up to 600-700 meters above sea-level. The decisive proof to us has been whether the place had old concentrated vegetation or fresh moraine soil with open vegetation.

Generally we have not stated the exact dates of flowering of the plants. After having kept, through a longer period of years, a journal of the earliest flowers from a single place and its vicinity we have arrived at the conclusion that a certain succession in the time of flowering can be proved for a majority of the arctic species, but that the actual dates may vary at least 6 weeks, namely just as much or more than the date varies at which the positive mean temperature begins. A few pronounced arctic species have no definite flowering season at all, they flower continuously throughout the period of vegetation.

As a general fact may be stated that the true arctic species (northern and widely distributed types) flower early, the subarctic or temperate late, provided that they attain to put forth flowers at all. When two systematically closely allied species belong each to its own type a characteristic difference, as to their flowering season, may be found, this fact being supported by numerous examples:

Early flowering.	Late flowering.
<i>Deschampsia caespitosa</i> var. <i>pumila</i>	<i>D. alpina</i> .
<i>Luzula confusa</i> , <i>L. nivalis</i> .	<i>L. frigida</i> , <i>L. spicata</i> .
<i>Stellaria longipes</i> , <i>St. humifusa</i> .	<i>St. borealis</i> .
<i>Potentilla Vahliana</i> , <i>P. nivea</i> .	<i>P. alpestris</i> .
<i>Chamaenerium latifolium</i> .	<i>Ch. angustifolium</i> .
<i>Pirola grandiflora</i> .	<i>P. minor</i> , <i>P. secunda</i> .
<i>Pedicularis lanata</i> , <i>P. hirsuta</i> .	other species of <i>P.</i> , the latest flowering is <i>P. euphrasioides</i> .
<i>Erigeron eriocephalus</i> .	<i>E. unalaschkensis</i> .
<i>Antennaria alpina</i> .	<i>A. intermedia</i> .
	etc.

At another occasion we hope to come back to this subject, meanwhile confining our attention here to statements of early and late flowering in such cases where this seemed especially characteristic to us, just as we everywhere have stated absence of flowering as far as this was known to us.

Likewise we have everywhere mentioned if the plant fruits, and our observations are in this case based, not only upon observations and gatherings of seeds and fruits in nature, but also in most cases upon seedlings which we have either collected or observed in nature or cultivated from gathered seeds. Also this material will be treated of in another place. We have especially tried to give minute information in regard to these cases in which fruiting occasionally took place or was always wanting.

Finally we have stated — mainly proceeding along the lines laid down by HARTZ (l. c.) — our observations concerning the hibernation of the plants whether it took place under cover of snow, cover of ice or snowless. But we have hereby only considered the living parts of the plants, buds, live leaves and stalks, and not the withered fruiting inflorescences.

It is only occasionally that we have stated the occurrence of plants with withered inflorescence over the snow («winterstanders», SERNANDER), partly because we think, that a plant with empty or unripe fruits whose seeds consequently have lost their power of germination, ought not to be classed here, and partly because our observations on this point are not yet complete.

Naturally we have made our experiences from the vicinity of our home in South-Disko the basis of these biological observations. As to species occurring only in more remote regions, which we have but been able to see during winter, we have, as far as possible, tried to judge of the cover of snow there, which is deducible from the local conditions predominant in the place: chiefly the aspect of the rest of the vegetation and, to a great extent, the occurrence of lichens on boulders and stones. In this connection we have again drawn upon our experiences from numerous sledge-travels and excursions during winter, not only on Disco, but also far to the south and north of it. Besides travels along the coasts we have made numerous trips into the inner highland of Disco, through the peninsula of Nûgssuaq and the Ataneq-fjord, Nordre Strømfjord, Isortoq fjord to Holsteinborg.

Numeration.

In the list we have incorporated with numbers all indigenous species and such varieties or races which had a distribution deviating from the main species.

Without number we have incorporated such species that are mentioned in literature, but whose occurrence in the locality we doubt; furthermore acclimatized introduced species. On the other hand we have not at all incorporated the numerous weeds which now and then appear near the settlements, leading but an ephemeral existence.

Type-denomination and -symbols.

At almost every species we have stated to which type of distribution it belongs. In this we have mainly considered West Greenland in its entirety, and then the rest of Greenland, America or Europe.

Besides we have tried to fix the type-determination in a symbol which through its form might direct the thought to what it ought to express, and yet be produced in ordinary typographical get-up. Thus signifies:

- T** a species whose main distribution is in the high arctic territory and which only, as an isolated exception, occurs to the south of this.
- V** a northern type whose distribution extends from the high arctic territory more or less far down into W. Greenland where it gradually becomes scarcer or at last occurs but as alpine.
- !** an arctic type widely distributed in W. Greenland yet decreasing, alpine or quite absent in the very southernmost part.
- I** a widely distributed species without northern- or southern limits in W. Greenland.
- !** widely distributed species which yet, as far as hitherto known, become scarcer or are quite absent as well in the northernmost as in the southernmost W. Greenland.
- i** widely distributed species without southern limit, but which yet in the northern tracts become very scarce, confining themselves to specially favourable sites or being quite absent.
- A** southern types, subarctic species without southern limit, but with more or less sharply marked northern limits in W. Greenland: in our area all of them lowland plants.
- L** non-arctic types whose main distribution in other countries is in the temperate regions; in our area they are rare and without continuity in their distribution. A great number of aquatic plants are classed among them.

Finally we have incorporated with number two plants that hitherto have been found only in South Disco. They are not sufficiently known

being probably either hybrids or chance mutations, endemic species in an embryo state.

They are indicated thus: •

The distribution in the adjacent parts to the south of the area is briefly subjoined, quoted almost exclusively from L. KOLDERUP ROSENVINGE's carefully revised "Andet Tillæg etc.". As to the distribution to the north of the area we have made use of ABROMEIT's revision of VANHÖFFER's collections, but especially of our own observations published in "Vascular Plants 71°—73°".

Cryptogamae vasculares.

I. Polypodiaceae.

L 1. Dryopteris Linnaeana C. Chr. (*Aspidium Dr.* (L.) BAUMG.)

In herb-mats and copses, often in the shade under rocks, but always in favourably situated, sheltered places; especially near the hot springs.

Disko: The south-coast from Laksebugt to Skansen, from many places (several collectors). Disko-Fjord: the north-coast, rarer; the northmost at Kuáner-søq 69°32' (P.).

Mainland: N. Isortoq 67°10' (Ros.), Prastefjæld at Holsteinborg (W. & H.), (P. & E.).

A decided southern type; in vain searched for in a great many favourably situated places in the fjords south of Disko-Bay. South of the here mentioned place from 65°64' and (according to Rosenvinge) common south of 63°.

All the mentioned places in the lowland. Usually *sori* are found, but sporangia only seen on specimens from Kuáner-søq.

During the winter under a thick cover of snow.

V 2. Dryopteris fragrans (L.) SCHOTT.

On sheltered, sunny, not too dry rock-shelves; more scarce on stony soil in the heath.

Disko: Very rare, hitherto only from the vicinity of Godhavn (V.) and basalt-rocks behind Evqitsøq in Diskofjord 69°32' (P.).

Mainland: Rather common in the gneissic tracts, especially at some distance from the outer coast; from 70° at least to 67°. Still, in the fjords inland from Holsteinborg, rather common. The southmost locality hitherto known at ca. 64°44'.

In Greenland a decided northern type; in U. S. A., however, to be found down to New England and Minnesota.

Ascending at least to 700 m.

To be sure often snowless during winter, the living shoots being protected by the withered old leaves.

Abundantly fruiting.

I 3. **Dryopteris dilatata** (HOFFM.) A. GRAY.

In sheltered and humid herb-mats, very rare in our area.

Disko: Recorded from Godhavn, 69° 14' (Sørl.) but afterwards vainly searched for on every suitable spot here.

Mainland: Portusūt Island N. of Kangatsiaq, 68° 27' (Kr.), Itivneq, 66° 58' (W. & H.).

A decided southern type, not common till south of 62°.

Covered by thick layers of snow in winter. The specimens from Portusūt were fruiting.

I 4. **Polystichum Lonchitis** (L.) ROTH.

In sunny and moist herb-mats, on rock-ledges and in bushland.

Disko: Mellemfjord: Kuānit 69° 44' (P.). The south coast of Disko at Godhavn especially Engelsmandens Havn, several collectors. Blæsedal (Th. H.).

A decided southern type. On the main land found south of 65° 25' only.

Abundantly fruiting. Hibernates under a thick cover of snow.

I 5. **Cystopteris fragilis** (L.) BERNH.

On sunny, not too dry rock-ledges, in fissures, herb-mats, and thickets, but not at all everywhere; yet found in numerous favourably exposed localities, throughout the whole area.

Chiefly in the lowland, but also higher up now and then. Widely distributed species without northern or southern limit in Greenland.

Occurs in several forms according to the quality of the habitat.
Abundantly fruiting.

Rhizome and buds always covered by snow.

I 6. **Woodsia ilvensis** (L.) R. BR. and var. **alpina** BOLTON ASCH. & GRAEBN.

On rocks and often on gravel and similar barren places. Very common throughout the whole area, but rarer on basalt than on gneiss. Most frequently the variety occurs, the main-species being limited to the most favourable conditions and is likely not to be found in the northern part of the area.

The species widely distributed, with northern limit in Greenland, but the precise limit cannot yet be settled, undoubtedly occurring north of 74° .

Ascending the hills certainly to the snow-line.

Abundantly fruiting.

Rhizomes and buds covered by the withered leaves which are loosened by the pressure of the snow-cover, being squeezed together in a lump that contributes to protect the rhizome and the buds till the snow melts or drifts away.

Certainly snowbare now and then.

V

7. **Woodsia glabella** R. Br.

On warm, moist rock-ledges often near waterfalls, rarer on gravelly soil. Rare, only occurring in small associations and often as isolated specimens only.

No doubt often overlooked.

Disko: Near Godhavn. On rocks near a spring in Osterdal (Th. P.) Blæsedal near Rode Elv on basalt gravel (Ekblaw).

Diskofjord: The basalt-rock at Evqitsoq (P.), Kuånerssuit (P.).

Mainland: Eqe $69^{\circ}45'$ (P.), Igdlularssuit $69^{\circ}50'$ (P.), Christianshaab (V., Th. H.), Tasiussarssuaq (Bg.), Sofiehavn (Bl.), the mainland south of Nivåq Fjord $68^{\circ}30'$ (P. & E.), Kangerduarssuk E. of Agto $67^{\circ}59'$ (E. P.), N. Isortoq $67^{\circ}15'$ (V.), Ikertôq (V.).

Just as *Dryopteris fragrans* this species, too, is a northern type in Greenland, although it is found far southwards in U. S. A.

Hence in W. Greenland the southern limit is at the last mentioned locality.

On the other hand it has been found in E. Greenland down to $61^{\circ}30'$.

All the above-mentioned localities are in the lowland, but southwards it is likely to be found at considerable altitudes.

Abundantly fruiting.

No doubt always covered by snow in winter or enclosed in ice.

II. **Ophioglossaceae.**

I

8. **Botrychium Lunaria** (L.) Sw.

On warm and somewhat moist slopes, in herb-mats often in shade under other vegetation.

Disko: Environs of Godhavn $69^{\circ}15'$; from Engelskmandens Havn to Kuånit gathered at several places by various collectors.

A decided southern type, on the mainland hitherto only found to $65^{\circ}10'$ and not common till S. of 62° (Ros.). Lowland plant.

Fructificates in favourable places.

Covered by thick layers of snow in winter.

I 9. **Botrychium lanceolatum** (Gmel.) Angstr.

Disko: Engelskmandens Havn, only found once and in a single specimen (E. P.), afterwards often searched for in vain.

A decided southern type, in Westgreenland only known from several places between 60° and $61^{\circ}30'$ and single specimens from 63° and $64^{\circ}25'$.

Our specimen was abundantly fructificating (Aug. 1911).

III. Equisetaceae.

I 10. **Equisetum variegatum** Schlecht.

In bogs, swamps and heath among mosses and other vegetation, often in water some part of the year; frequently forming pure associations, especially on periodically inundated sand. Thus at the river-mouths in the sandstone-districts.

Common throughout the whole range.

A widely distributed species, the northern limit of which must be N. of $72^{\circ}30'$, but is not yet known.

At Disko-Bay ascending the hills to 800 m.

Mostly sterile; fructificating specimens found especially in favourable places.

During winter covered by snow, often also by ice.

I 11. **Equisetum scirpoides** Michx.

In luxuriant not too moist herb-mats and bush-land, often in shade.

Disko: Very rare, only found a few times in the neighbourhood of Godhavn $69^{\circ}15'$ (Br.; Bg.; Th. H.; Kr.) and now most likely extinguished because of the cutting down of the willows for fuel.

Diskofjord: Kuánerssuit ($69^{\circ}33'$ P.).

Mainland: Tasiussaq S. of Egedesminde, $68^{\circ}40'$ (W. & H.).¹ Kangerdluarssuk S. of Agto $67^{\circ}59'$ (E. P.), in Nordre Stromfjord (P. & E.), at several places and rather common in the fjords inland from Holsteinborg (P. & E.).

A decided southern type; among the above mentioned localities the north-limit is to be found.¹ S. of Holsteinborg it seems to become rarer or perhaps overlooked.

¹ In herb. JOH. LANGE I have seen a specimen labelled "Tasiussaq 2^{2/3}; 1887. Ryder." If correct that would mean the place at $73^{\circ}22'$, but I think the record must be due to some confusion.

All the mentioned localities are in the lowland.
Mostly abundantly fruiting.
Hibernates covered by thick layers of snow.

I 12. **Equisetum sylvaticum L.**

A decided southern type, from 65° and southwards rather common. N. of this latitude it is recorded from Aulatsivikfjord 68°0' (Bg.); an islet in the Sydostbugt (Bg.); Imilik at the icefjord of Jakobshavn 69°10' (Sor.) and Disko at Godhavn (Walker). In all these places it has been repeatedly sought in vain for by us, and it has never been found, neither by the above mentioned collectors nor by us, at the heads of the big fjords at Holsteinborg and north of it. The northmost specimens in H. H. are from South Isortoq (65°20') and vicinity of Godthaab.

I 13. **Equisetum arvense L.**

In bogs, swamps, and heath; often inundated a great part of the summer when growing on lakeshores. Also as undergrowth in rich herb-mats and thickets. Often it forms extensive growths along the shores of rivulets and lakes or in thickets.

Very common throughout the whole area.

Wide-spread species, probably without northern limit in Greenland. Ascends undoubtedly to the snowline. Abundantly fruiting except in the most humid places.

Covered by snow and often by ice in winter.

Varies very much in luxuriant places; in the southern part of the land, especially in herb-mats and thickets, forms occur with spikes on the branching green shoots.

IV. Lycopodiaceae.

I 14. **Lycopodium Selago L.**

In swampy heath and bogs, in herb-mats and willow-thickets especially on organogenous soil, not on petrogenous. Very common throughout the whole range. Wide-spread species, probably without northern limit on the coast of Greenland. Ascends the hills as far as the preceding vegetation has deposited sufficient mould, and is thus not among the pioneers of plants.

Varies according to the quality of the habitat; most common is *f. appressa* Desv. the very branchy, yellow-green form with densely appressed leaves. Hardly ever fruiting, but forming bulblets in abundance with great power of migration and germination. In vigorous heath, herb-mats and copses less ramified forms occur with distant leaves, in appearance and size quite similar to the main-species from the temperate

regions. The main form is often fructificating, it never forms bulletts or exceptionally a few at the top of the shoots. This latter form we have not seen north of South-Disko.

Covered by snow during the winter.

A

15. *Lycopodium annotinum* L.

In thickets and luxuriant heath.

Disko: Not uncommon on the south-coast, in the big valleys and the two southmost fjords. Not noted elsewhere on the island.

Mainland: Rather common in the gneiss-land, especially at some distance from the coast growing more and more common southwards. Not noted in the basalt- and sandstone-range and rare in the outer part of the archipelago of Egedesminde.

Common is var. *pungens* Desv. In thickets the mainspecies is rare, but there are numerous transitorial forms between them.

The species must be considered a southern type, rather widespread in Greenland, but getting more scarce northwards and here the north-limit is provisionally to be settled at 72°48'.

Usually a lowland plant, not ascending to any considerable altitude.

As a rule abundantly fruiting.

Covered by snow during winter.

I

16. *Lycopodium complanatum* var. *Chamaecyparissus* A. Br. (*L. tristachyum* PURSH).

A pronounced southern type recorded from Disko at Godhavn 69°15' (Sør.); in vain searched for by us for several years; besides found at Skansen 69°23' (Riklin).

From the mainland known from a few places, the northmost of which at ca. 65°.

A

17. *Lycopodium alpinum* L.

In favourably exposed heath and dry herb-mats.

Disko: Numerous localities along the southcoast (many collectors); Eqaluit 69°40' (P.); Mellemfjord Sarqardlit ilordlit 69°40' (P.).

Mainland: At the trading-place Nùgssuaq 70°40' (V.); Majorqarssuatsiaq 70°12' (Bg.); Jakobshavn (W. & H.); Egedesminde (W. & H.); Kangerduarssuk S. of Agto 67°59' (E. P.); Eqaluarsuit in Nordre Stromfjord 67°36' (P. & E.); N. Isortoq 67°10' (Ros.).

Recorded by many collectors and from numerous localities in the broad land, between 66° and 67°.

A southern type with north limit at the northmost of the mentioned habitats.

Lowland plant. Often sterile, although fruiting specimens occur now and then.

Covered by snow in winter.

V. Isoëtaceae.

I. 18. *Isoëtes echinospora* DUR.

A pronounced southern type found at Tasiussarssuaq, Sofiehavn $68^{\circ}25'$ (Bl.), otherwise not known till between 60° and 61° .

The specimens were sterile.

Gymnospermae.

VI. Pinaceae.

A. 19. *Juniperus communis* L. var. *montana* AIT.

On warm sunny rock-slopes.

A southern type known from several localities in the fjords inland from Holsteinsborg, but by no means common. In the interior of N. Stromfjord rare f. inst. Eqaluarssuit $67^{\circ}36'$ (P. & E.); Ipiutarssuaq $67^{\circ}44'$ (P. & E.); Sarfarsuaq $67^{\circ}50'$ (Korn.); Ugssuit $67^{\circ}58'$ (P. & E.); at Tasiussarssuaq $68^{\circ}28'$ (Bl.); Orpigssuit $68^{\circ}35'$ (Engell).

Finally, according to verbal communication from Mr. P. DALAGER, it is said to occur at the head of Kangersuneqfjord $68^{\circ}50'$ and thus we have the north-limit here.

All above mentioned localities are in the lowland.

Most of the observed specimens were abundantly fruiting. — No doubt covered by snow in winter, but early snowless in spring.

Monocotyledones.

VII. Sparganiaceae.

I. 20. *Sparganium submuticum* (HARTM.) NEUM.

Waterplant.

A decided southern type collected only in the following places: Naujat $70^{\circ}0'$ (Htz.); Orpigssuit $68^{\circ}37'$ (Htz.); Tasiussarssuaq $68^{\circ}28'$ (Bg. refound by Bl.); Nivåq Bugt, several places (P. & E.). Aulatsivik settlement $68^{\circ}10'$ (Kr.). Otherwise not observed till south of 64° , but likely often overlooked.

Some of the above mentioned findings were fruiting.

Hibernates under or enclosed in ice.

VIII. Potamogetonaceae.

Flowering, fructification and wintering.

All the species of this family, as well as the rest of the Greenlandic true waterplants, occur in shallow water especially in ponds that freeze

to the bottom during the winter. The length of their vegetative period especially depends upon the condition of the spring and the autumn. In case of a cold spring the ice along the pondshores is rather long in melting, and if the autumn sets in early, the ponds are quickly freezing up again. During such unfortunate summers the *Potamogetonaceae* (and other waterplants) hardly attain to flowering and not at all to fructification; they reproduce by continuous forming of winterbuds. In more fortunate seasons the period of vegetation in the same water will last long enough for the forming of flowers and fruits. But this is, in our area, an exception, all the following species being decided southern types with their north limit here.

As the climatic conditions in the arctic lands vary from year to year, and as the amount of warmth necessary to the vital functions of the plants is not only relatively, but also absolutely inconsiderable, it is no wonder that the same species on the same latitude is sometimes found flowering, sometimes quite sterile.

I 21. *Potamogeton alpinus* BALB.

Itivneq at Holsteinborg 66° 58' (W. & H.), only once collected here; the north limit of the species.

Known from Godthaabfjord and some places in the extreme South Greenland.

I 22. *Potamogeton gramineus* L.

In a small lake near the river to the head of S. Stromfjord ca. 67° (Jens.) only once found here. The north limit of the species.

Elsewhere only known from the southmost part of Greenland 60°—61°.

Note: The species is also recorded from Rode Ely at Godhavn 69° 15' by Rev. Sorensen. The specimens were determined, and of course correctly, by Prof. L. K. ROSENVINGE, but from where it originates, we cannot say. It can not be from Rode Ely, this being a cold glacier-torrent in which no phanerogamous water-plant is able to thrive, least of all a *Potamogeton* with a southerly distribution as *P. gramineus*.

I 23. *Potamogeton mucronatus* SCHRAD. (*P. Friesii* RUPR.).

Diskofjord in small ponds at Eqalunguit Hvinnere 69° 32' (P.) det. Prof. C. RAUNKÆR. Afterwards not seen in Greenland.

The specimen was sterile.

I 24. *Potamogeton obtusifolius* M. & K.

The district of Egedesminde: Ikamiut inlet in Nivåq Bugt 68° 40' (Kr.).

The specimens were sterile.

A 25. *Potamogeton pusillus* an L.? (*P. groenlandicus* HAGSTR.)

Collected several times in the vicinity of Diskobugt; perhaps more careful observation will prove the plant to be of not infrequent occurrence.

Disko: A pond at the blubber-yard at Godhavn 69°15' (P.).

Mainland: Sarqaq 70°0' (Htz.), the north-limit of the species, Ritenbenk 69°45' (S. H.); Jakobshavn 69°13' (Sor.); Claushavn 69°5' (Bg.); Christianshaab Orpigssuit (Htz.) 68°37'; Egedesminde (Bl.); Sofiahavn 68°25' (Bl.).

For the rest only known from a few localities in the southernmost part of Greenland, most likely overlooked.

A 26. *Potamogeton filiformis* PERS. (*P. marinus* L. p. p.).

This species has been found a few times in the fjords inland from Holsteinborg 66°58' (W. & H.), and here later on found to be commonly extended in all smaller ponds (P. & E.); at the head of S. Stromfjord about 67° (Jens.); Itivdlinguaq 66°29' (P. & E.). Southwards it is known from Godthaabfjord and from several localities in the southmost part of Greenland, being no doubt common here.

The next domain is in the vicinity of the Sydost-Bugt: Manitsaq at Egedesminde 69°45' (Bl.); Tasiussarssuaq and the passage to this place about 68°30' (Bg. and others); at the head of Orpigsøq 68°40' (Htz.); Christianshaab 68°45' (V.).

Further it has been found isolated at Narssaq on Disko 69°52' (Th. Fr.); Nūgssuaq Peninsula: Atanikerdluk 70°5' (Htz.) and Ikerasak 70°30' (Vh.), the northern limit of the species.

In some of the mentioned localities the species were flowering.

IX. Juncaginaceae.**A 27. *Triglochin palustre* L.**

On strand-meadows, on lake-shores in marshes and periodically inundated riverbeds.

Undoubtedly often overlooked.

Disko: From localities on the southern coast and Diskofjord (P.); Nordfjord: in the big valley from the head of the fjord about 70° (P.).

Mainland: From Jakobshavn down to the fjord-complex inland from Holsteinborg found so often as to be considered common. N. of Jakobshavn found now and then along the coast of Waygat up to Atā 70°15' (P. and others); in the Nordost-Bugt at Ikerasak 70°30' (Vh.) and Umánaq 70°43' (Vh.) the northern limit of the species.

A decided southern type, in the district not ascending to any height worth mentioning.

Flowers and fructificates abundantly, but not every year.

Hibernates abundantly covered by snow and sometimes also by ice.

X. Gramineae.

I 28. *Hierochloë alpina* (Linné) R. & S.

On mouldy and peaty soil, on rocky flats and especially in dry heath, rarer in thickets and herb-mats.

Stands manuring very well, but does not occur in aggregate patches.

Very common throughout the whole area.

Wide-spread arctic plant with neither northern nor southern limit.

Ascends the hills to the snow-line, but only in old vegetation, not belonging itself to the pioneers of the new moraines.

Abundantly flowering and fruiting.

Probably often snowless during winter. The live buds densely covered by the withered leaf-sheaths.

A 29. *Phleum alpinum* L.

In vigorous herb-mats and thickets.

Disko: South-coast at Godhavn 69°15' numerous localities (P.) and others; inside the Blæsedalen about 69°20' (Nygaard); Diskofjord (69°30') (P.) rare. All the localities in neighbourhood of hot springs.

Mainland: N. Isortoq 67°10' (Ros.); Præstefjeld at Holsteinborg 66°55' (P. & E.). Thereafter at 65° and 64° and common south of 64° (Ros.).

A decided southern type, the above mentioned localities being the north limit in Westgreenland.

All the mentioned localities are in the lowland, but in the south-most part of Greenland it is observed to a height of 500 m (Ros.). Flowers yearly, but only as an exception does it fruit in the most favourable localities. The grains are however not spread, remaining in the spike under the snow, but through experiments I have ascertained their growing power (E. P.).

Hibernates abundantly covered by snow.

V 30. *Alopecurus alpinus* Sm.

The natural habitats of the plant are moss-bogs and moist spots in the heath; but owing to its great predilection for organisical manure and great power of dispersal it appears at all the present and former settlements, tent places, underneath fowling cliffs, on fowling islets and near fox's dens in friable soil. In these manured places the plant becomes much more vigorous than in the bogs and forms extensive patches that characterize the settlements more than any other plant. When the supply of manure is stopped, an abatement in its luxuriant growth sets in; hence we can, to a certain extent, draw a conclusion, as to the age of the old settlements, from the rate of its development.

Sometimes it occurs in places that are inundated in the spring and early summer. In these places it develops long floating leaves and resembles the following species.

During wet summers, when the pools do not dry up, it does not flower, thus differing from the following one.

Because of its vegetative luxuriance in manured places it is particularly adapted to fodder for sheep and goats, both as green fodder and as hay, and perhaps it may prove itself a valuable fodder-plant in subalpine regions. But there is an inconvenience by the hay-making: the plant forms big semispherical tufts which render the mowing with scythe difficult. The green turfs formed by its web of roots are very compact, hence preferred by the natives for house-building.

Very common on Disko and the Mainland around Disko-Bay; also common in the archipelago of Egedesminde district and southwards along the coast down to Holsteinsborg.

Still frequently to be found at the tent places in the fjords, but else very rare here or quite absent.

Possibly it may be found isolated in alpine habitats; we did not find it during any of our excursions on the hills although we searched for it.

In N. Strømfjord it was very common on the islet Taseralik at the mouth of the fjord, where yearly 3—400 men and women meet; at the tent- and fishing-place Eqaluarssuit it was found in great abundance, but locally; but not at any of the tentplaces within that, not even in the hills.

In the region of Holsteinsborg it has been found a few times in the vicinity of Amerdloq-Fjord down to 66°45' and for the present this place must be established as the south limit of its continual distribution. It has been recorded isolated from the head of Kangerdluarssuk-Fjord at Frederikshaab by TH. HOLM (ENGLERS Jahrbücher VIII, p. 200), but the specimen does not exist. Mistake of identity is excluded; perhaps it was alpine here, but this is not recorded by the collector.

Northern type; in East Greenland known to ca. 68°, but does not occur on Iceland (yet in Scottish mountains).

Ascends, following the bog-formation, to the snow-line.

Abundantly flowering and fruiting.

Hibernates covered by snow.

A 31. *Alopecurus aristulatus* MICX.

Rooted in small ponds and on lake-shores with floating leaves and stalks. During exceptionally dry summers to be found trailing on the

desiccated borders preferably in the shade of overhanging *Carex* tufts, but withers when exposed to long desiccation.

Seems in Greenland to be rare, but occurs widely distributed in isolated growths.

Disko: The south coast, in Blæsedalen (P.), Diskotjord; Evgitsøq 69°30' (E. P.); Nordfjord; on the southern side of the mouth 69°55' (P.).

Mainland: Sægåq about 70° (Th. Fr., re-found by E. P.); Taseralik 67°25' (E. P.); N. Isorloq 67°10' (V.); Holsteinsborg 66°55' (V.); at the head of S. Stromsfjord (Jens.).

In deeper water floating and sterile forms are common (cf. SIMMONS: Über einige lappl. Phanerog. Arkiv för Bot. 6, No. 17, p. 4; idem: Bot. Not. 1908 p. 121-128).

A decided southern type, south of the area known from Godthaabsfjord and a few localities between 60° and 62°.

The north limit at Ikerasak 70°30' (Vh.).

Ordinarily flowering and fruiting.

Hibernates under or enclosed in ice.

Agrostis canina L.

Recorded from Egedesminde by BERLIN (Öfv. K. Vet. Ak. Förh. 1884, No. 7, p. 76), but the author himself seems to doubt the correctness of his own determination. Probably confounded with the following species, otherwise only known from the west coast between 60° and 62°.

A 32. *Agrostis borealis* HARTM. (*A. rubra* WAHL p. p.)

In dry stony soil: dry rocky-flats, rarer on gravel and dry heath-vegetation.

Disko: Common in the gneiss-domain of the south coast; strangely not found on basalt.

Mainland: Common in the gneiss domain, especially southwards at some distance from the coast.

In the districts of Jakobshavn and Christianshaab the localities are situated at some distance from each other though rather numerous. Not found within the basalt and sandstone-domain of Nùgssuaq.

A southern type, north of the area found on Qaratsap-Nunata 70°30' and at the head of the fjords inland from Proven 72°30' (Th. P.) this hitherto being the north-limit.

Ascends the favourably exposed hill-slopes to at least 500 m.

Flowers and fruits abundantly.

No doubt often without any cover of snow during winter.

V

33. *Arctagrostis latifolia* (R. Br.) GRISEB.

In bogs and vigorous heath, scarce on gravel in riverbeds.

A decided northern type, the southmost occurrence of which is to be settled within the area.

Disko: The northland here and there; the southmost locality is on the southern side of Nordfjord about 69°55' (P.). HART I. c. p. 304 states the range of the species to lie between 69°14' and 81°51'. The first mentioned latitude corresponds to that of Godhavn, but as I have not been able to re-find the easily recognizable species here during a stay of 12 years, I am inclined to consider the record as erroneous. — Hare O (P.); Nügssuaq, the Interior (P.); and along the coast of Waygat; the southmost localities here are Atanikerdluk (Th. Fr.) and Sar-qaq about 70° (V.); Eqe, at the edge of the inland ice at a height of 700 m is the southern limit of the species (69°44').

Abundantly flowering and fruiting.

Covered by snow during winter.

i

34. *Calamagrostis purpurascens* R. Br.

In sandy and gravelly localities in riverbeds and deltas, on rock-edges and in crevices; rare in heath.

Disko: Rather common on the northland especially on the coast of Waygat and in the adjacent valleys as well as in the interior; at Mudderbugt, in the sandstone-domain. Diskofjord: at Ikineq, on gneiss-rocks and gravel. Otherwise not observed on the southland (P.).

Hare O (P.).

Mainland: Common in the sandstone-domain of the coast of Nügssuaq (P.), and known from numerous localities between Torsrukatak and the Sydostbugt (P.). South of Disko-Bay it seems to be perceptibly scarcer and mostly to occur at some distance from the out-coast. The rapids of Arfersiorlik (K.), N. Stromfjord: Sarfarssuaq (P. & E.) and the vicinity of the fjord-arm of Ugssuit, common (P. & E.); N. Isortoq 70°10' (V.); Ikertöq Fjord (V.); Itivneq 66°58' (W. & H., P. & E.); Sar-fanguaq 66°55' (W. & H.); S. Stromfjord 66°35' (Jens.).

This species has formerly been included among the southern types by me (Medd. om Gronld. 50 p. 386), but I now doubt the correctness of this statement.

South of the territory treated of here it has been found a few times in West Greenland down to ea. 61° (in H. H. I have not seen specimens from localities south of 64°!), but there is, in fact, nothing strange in the occurrence a plant of a high-arctic range to the south of its continual distribution, for instance on the hills whence they occasionally are washed down in the lowland. The southern limit therefore will always be less distinct than the northern.

But according to my observations in the regions around Disko-Bay and northwards (made after the publishing of the above mentioned paper) the species occurs more frequently northwards, and on

Disko it just occurs in the area of the northern types, being rarer on the southland.

At the northmost known locality of the species: Laksefjord 72°30' it was too common for settling this place as the northern limit.

Therefore I am inclined to consider it a northern type in Greenland, belonging to that contingent of West-American arctic species migrated to Greenland over Smith-Sound. (Cf. SIMMONS: Phytogeography p. 135 sqq. and Map. I).

On favourable expositions, i. e. rather warm sandy-gravelly tracts, where it does supplant either other Gramineae or other vegetation it is able to become so abundant as to characterize the vegetation, thus in the inmost of the Kûgânguaq-valley on the northside of Disko; but it never forms dense carpets as other species of the genus.

In the sandstone-domain of Wayat it ascends to considerable heights.

Abundantly flowering and fruiting.

Undoubtedly often snowless. The living parts of the shoots are protected by the withered remains of the leave sheaths.

A 35. *Calamagrostis hyperborea* LANGE, ROBINSON & FERNALD.

In vigorous, sandy and moist localities in herb-mats and thickets.

Disko: The south coast 69°15' very rare near Udkiggen at Godhavn (Nygaard!); Osterdalen near the hot springs (Th. P.!).

Mainland: Pâkitsoq 69°28' (V.); Tasiussarssuaq 68°20' (Bg.); Sofiehavn 68°20' (Bl.); N. Stromfjord: several places (Korn.; Holst; Th. Fr.) Iputarssuaq 67°44' very common (P. & E.); vicinity of Holsteinsborg: Sarfânguaq 66°58' (E.P.); Maligiaq 66°58' (P. & E.); Naujarssuit in Qeqertalik 66°44' (P. & E.).

A decided southern type, the northmost localities is Úmánaq (Rink teste Lange) 70°40'. South of the area found in several localities. S. of 64° the localities are lying rather closely together, but it is probably nowhere common.

Often forming large dense carpets.

All the above mentioned localities are in the lowland.

Abundantly flowering and fruiting.

Covered by thick layers of snow during winter.

A 36. *Calamagrostis neglecta* (EHRH.) FL. DER WETT.

On moist sand, especially on lake-shores and along water-courses.

Disko: The southland from Mudderbugt to Diskofjord included, rather common (P.); Laksebugt 69°40'; the valley of Iterdagssuaq 69°45' (P.) in Mellemfjord; in valleys in the northwest-land at 70°11' (P.); Hare O (P.).

Mainland: From the tracts of Holsteinsborg to the icefjord of Jakobshavn rather common, especially at some distance from the outcoast (P.). Becoming rarer northwards; Ritenbenk (Bg.); Pâkitsoq-fjord (V; Bg.; P.); Atanikerdluk (Htz.); Nûgssuaq (P.).

A southern type with hitherto known north limit on Schades Øer $71^{\circ}22'$ (P.).

Often forming carpets recognizable at a distance by the green colour and without admixture of other species.

Abundantly flowering and fruiting.

Hibernates covered by snow and often by ice.

A 37. *Calamagrostis Langsdorffii* (LINK.) TRIN.

On favourably exposed, moist hill-slopes, along rivulets and especially at the edge of thickets.

Disko: Very rare; at Godhavn $69^{\circ}15'$ (R. Br. Wetherill, not re-found by us; perhaps extinct owing to the felling of willows; near Skansen (Rikli!), and in the valley of Kûgssuaq $69^{\circ}30'$, within this locality (L. Geissler).

Mainland: Qeqertaq 70° , seen in the houses of the natives used as boot-straw (P.); Pâkitsoq-fjord several localities (V.; P.); Egedesminde $68^{\circ}40'$ (P.).

From here southwards becoming common in the fjords and the valleys of the larger islands; in the interior around of N. Stromfjord very common (P. & E.), as well as in the fjords inland from Holsteinsborg (P. & E.).

A decided southern type having its northern limit at 70° .

As a rule forming extensive dense carpets. Because of the length, the delicacy and the toughness of the straw highly valued as boot-straw by the natives, being the best material for this purpose. From Egedesminde southwards often used for the making of domestic industrial objects, for instance trays, baskets and caps.

All the above mentioned localities are in the lowland.

Abundantly flowering and fruiting; at the northernmost localities not annually getting ripe.

Hibernates covered by thick layers of snow.

I 38. *Deschampsia flexuosa* (L.) TRIN var. *montana* (L.) HARTM.

Very rare, not common till the southmost part of Greenland 60° – 61° (Ros.).

In the area found at Itivneq $66^{\circ}58'$ (W & H.); besides recorded by SØRENSEN from Godhavn $69^{\circ}15'$. Determined by L. K. ROSENVINGE and approved by GELERT in Fl. Arctica, but the specimen may not originate from Godhavn. The only member of the genus, which I have found at Godhavn after a search extending through many years, is a form belonging to the following species.

A pronounced southern type.

V 39. *Dechampsia caespitosa* (L.) BEAUV. var. *pumila* LIEBER.

On moist sandy clay, sometimes almost submerge on lake-shores; very rare.

Disko: Godhavn 65° 14' near Udkiggen (Rikli; P.); the west coast (Wetherill); the north coast; Gjeseekes Dal, 70° 15' (P. 1902 det. C. H. OSTENFELD; Medd. om Grønld. 43 p. 13, re-found 1916 P.). Hare O. (Nath.).

A decided northern type, the above mentioned localities representing the south limit; for the rest only known from a few localities on the coast of East- and West Greenland (Cf. OSTENFELD, l. c. and PORSILD Medd. om Grønld. 50, p. 365).

On land abundantly flowering and fruiting, being only rarely submerge.

Hibernates covered by snow and ice.

A 40. *Deschampsia alpina* (L.) R. & SCH. (Syn. *Aira caespitosa* var. *borealis* TRAUTV.).

A pronounced southern type common south of 64° and only known from a few localities in the southmost part of the area.

The region of Holsteinborg 66° 55' (Th. Fr.); S. Kangerdluarssuk about 67° (W. & H.); Eqaluarssuit in N. Stromfjord 67° 36' (P. & E.) several places on sandy, clayey riverbanks.

The last mentioned locality for the present the north limit.

The species was here abundantly flowering, but viviparous. Everywhere we found spikes a year old weighed down by the early fall of snow, the bulbils being not yet ripe and ready for dispersal. Several of the specimens had preserved their power of germination, but the power of migration of the species seemed to be lost.

I 41. *Trisetum spicatum* (L.) BEAUV.

On fell-field, clefts, vigorous heath, herb-mats, thickets, strand-dunes, often in manured soil at the houses and below fowling cliffs (f. *villosissima* Lge.), but not on newly-formed moraine; f. *laxior* Lange is a shade-form from thickets.

Very common throughout the whole area.

Neither southern nor northern limit in Greenland.

No doubt ascending the hills to the snowline, but not among the pioneers of the newly-formed moraine.

Abundantly flowering and fruiting.

Undoubtedly always covered by snow during winter.

T

42. **Dupontia Fisheri** R. Br.

In moist marsh-land and meadows or submerse in shallow pools and lagoons.

A pronounced high-arctic plant with southmost occurrence in the northern part of the area.

Disko: On the northland from several localities between Qutdigssat at the Waygat about 70° and the head of Nordfjord and the valleys herefrom (P.).

Mainland: The coast of Nûgssuaq from 70°15' to the mouth of the great river, about 70°30' (P.).

In the localities, from which I have observed this plant, as well within the area as farther northwards, it was growing near the shore; a single exception is the great valley of Nordfjord where it grows on newly raised fjord-bottom.

Therefore I am inclined to consider the plant as halophilous.

Hence all the localities in the lowland.

Occurs forming widely extended carpets almost free from other species and easily recognizable by the striking red-brown colour. In water of some depth the whole carpet is ordinarily sterile, but near the shore and on dryer ground it is abundantly flowering and fruiting.

During winter covered by snow and, as a rule, also by ice.

I

43. **Phippsia algida** (Sol.) R. Br.

In moist localities among other Gramineae, in heath and bogs, in manured soil near the houses and the deserted settlements, at pools, on fowling islands and in the hills at the border of the melting snow-fields.

Very common throughout the whole area, in the southern part however, confined to the belt of rocks and islands girding the coast; or in the mountain region of the interior, the ground of the lowland here being occupied by competitors.

At the settlements it has found its way, moreover, to the Danish gardens and together with *Stellaria media* it has become a trouble-some weed in the hotbeds. Here it develops to a phantastic size compared with its appearance in nature.

A widely distributed arctic plant, in Greenland without neither northern nor southern limit, decreasing however, in frequency southwards, rather a northern type.

i

44. **Poa pratensis** L.

In nearly every kind of soil from the coast up to considerable altitudes. On luxuriant slopes and on bushland very vigorous and often forming dense extensive associations. Near new settlements it conquers

the manured soil and holds its own for several years until finally it is overpowered by *Alopecurus alpinus*. In rich and manured soil adequately irrigated during the period of vegetation it attains, about Disko Bay, a height sufficient for hay-making.

Very common in the whole area.

Widely distributed in Greenland, without southern and probably also without northern limit.

Flowering and fruiting abundantly.

Most regularly covered by snow during winter.

i 45. **Poa arctica** R. Br. (*P. cenisia* Auct. non All.).

In dry heath, in stony, gravelly or rocky soil a little rarer than the preceding species in the lowland, becoming commoner upwards.

Common throughout the whole area, in the fjords of the southern parts; scarce, however, in the richly plant-covered lowland.

Widely distributed arctic plant, without northern limit in Greenland; also found down to Cape Farewell, but according to ROSENVINGE scarce and principally alpine in South Greenland. Hence we consider the species as a northern type.

Ascending the hills to the snow-line.

Abundantly flowering and fruiting. Seldom occurring in pure associations.

Probably often snowbare during winter.

i 46. **Poa alpina** L.

In soil rich in humus, on herb-slopes amongst thickets and in luxuriant heath, sometimes amongst mosses at springs, or in rock-crevices, more seldom in sandy or clayey soil poor in humus along watercourses.

Disko: Common in the southern part and in the two southernmost fjords, rarer in the southern parts along the Waygat, and here mostly confined to springs and other luxuriant spots. Nordfjord, occurring in the big valleys. West coast: locally, but rare. North coast: not observed.

Hare Island: south coast, rare (P.).

Mainland: rare on the coasts of Nügsuaq peninsula, becoming more abundant south of Torsukáatak, southwards common except on the smallest and outermost lying islets of the archipelago.

As to distribution on Disko resembling the southern types, to which it is to be reckoned. Widely distributed in Southern Greenland without southern limit. The exact northern limit of the species is unknown, its occurring to 74° is certain, from places north of Cape York it has often been stated in literature, but SIMMONS has proved most of the statements to be erroneous or at least improbable.

P. alpina often characterizes rather large areas, but it never forms dense associations.

On favourable spots, ascending the slopes to considerable altitudes.

Abundantly flowering and fruiting. Viviparous specimens have never been seen by us.

Snow-covered during winter.

T

47. **Poa laxa** HAENKE.

In Fl. Arct. GELERT states the distribution of this species as lying between 60° and $70^{\circ}!$; the sign of ! indicates that he has seen and approved the determination of the specimens from within these limits. But in H. H., revised by GELERT, I did not in 1910 find any specimens gathered from localities north of $66^{\circ}55'$. I have various specimens myself from the coasts of Disko and Nügssuaq corresponding fairly well with the diagnosis of *P. laxa*, but owing to the lack of figures and exactly determined Greenlandic material of *P. laxiuscula* LANGE I dare not quite trust these determinations, the closely related *P. glauca* being so very much variable.

A southern type.

Abundantly flowering and fruiting.

Hibernates covered by snow.

T

48. **Poa abbreviata** R. BR.

On barren sand and gravel and newly formed moraine. A high-arctic species found a few times in the northmost part of the area.

Disko: The north-western coast: Igdlorput 70°5' (Th. Fr.); the coast of Waygat: Kûgânguaq 70°15' (Th. Fr.; P.); Asuk 70°10' (Th. Fr.; P.); Qutdligssat 70° (Htz.).

These localities represent the known southern limit in Greenland.

Here flowering and fruiting.

No doubt often snowless.

I

49. **Poa glauca** M. VAHL.

On fell-field; gravelly, sandy and stony soil, newly formed moraine, sand-shores and dunes, but also to be found under better conditions, for instance, in manured soil and thus frequent at the settlements. Varies without limits according to the quality of the place. Often forming extensive patches, especially when manured and irrigated during the period of vegetation. Not well adapted to forage plant for cattle, having only a few leaves and the straw being short, stiff and too early ripening.

Very common throughout the whole area.

Widely distributed species without either northern nor southern limit in Greenland.

Ascending from the coast to the snow-line.
Abundantly flowering and fruiting.
Often snowless during winter.

I 50. *Poa nemoralis* L. var. *glauca* BLYT.

Almost the same applies to this southern type as to *P. lara*. LANGE gives the distribution between 60° and 69° 20' and this GELLERI approves by his sign!; but in H. H. revised by GELLERI no specimens occur from localities north of ca. 67°. The localities recorded north hereof are: Disko (WALKER), some localities near Jakobshavn (R. Br.) and Christianshaab (W. & H.).

In addition I have referred to this species a grass from a few localities in N. Stromfjord: Eqaluarssuit 67° 36' and Ipintarssuaq 67° 44' (P. & E.).

The plant was here growing in thickets and seemed to have been fruiting the preceding year.

The above mentioned localities are from the lowland.
Hibernates under thick layers of snow.

Puccinellia.

The species belonging to this difficult genus have recently been thoroughly studied by various American and European botanists. Thus M. L. FERNALD and C. A. WEATHERBY in Rhodora 18, 1916 gave a description of the species in Eastern North America, accompanied by extensive synonymic and excellent figures. And on the European and Arctic species Dr. O. R. HOLMBERG, has published various smaller papers as precusory studies for an exhaustive monograph.

As I have had an opportunity of comparing my M. S. and my field-notes, but not my herbarium-plants, with the material in H. H. revised and labelled by Dr. HOLMBERG, it seemed desirable to bring the names of the species here treated of in accordance with the nomenclature of HOLMBERG's monograph, still unpublished. For that purpose my friend Dr. HOLMBERG kindly provided me with a list of the combinations to be used.

For the explanation of those combinations and their synonymic, in shorothy for the entire systematic part of the classification, the reader is referred to HOLMBERG's own work soon to be published.

V 51. *Pucinellia Vahliana* (LIEBM.) SCRIBN. & MERR. (Incl. *Glyceria Kjellmani* (LANGE).

In open spots in the heath, on newly formed moraine and on clayey and sandy slopes, but not halophilous.

Disko: The Northland from about 70° 0' on the coast of Waygat and around to the Nordfjord gathered from several localities, no doubt rather common (P.); in the great valleys from the head of Nordfjord 69° 50' (P.). Hare O (Nath.; P.).

Mainland: The westcoast of Nūgssuaq peninsula and the Waygat-coast down to Paotūt $70^{\circ}12'$ rather common (P.).

Decidedly a northern type having its south-limit at the mentioned localities.

Abundantly flowering and fruiting.

Probably sometimes snowless during winter.

I 52. **Puccinellia phryganodes** (TRIN.) SCRIBN. & MERR.
Catabrosa villoidea ANDERSS.).

On moist sand and clay at the sea-shore; in the Basalt- and Sand-stone-domains, for instance, within the dunes of the beach along the edges of lagoons; on alluvial formations at the mouths of rivers in the interior of the fjords. It attains to its highest development when regularly inundated by the tide, and in such places it forms a sort of marsh (PORSILD: Medd. om Grld. 65 p. 194, 217, Fig. 16. Résumé français p. 290, 299). Great areas are here covered by its trailing shoots and these form a low, but often very dense, purple-greenish carpet. In this condition it is always sterile. But when the sand-drifts arrive, the ground is raised so much as to prevent the high-water from but occasionally reaching it, the vegetative power is ceasing, and then, as a rule a few flowering specimens are to be found at the margin of the carpet. Apparently much rarer on the gneiss-coasts. When the rocks are falling straight into the water there will not be any room for the plant, but in the smallest inlet, with but the slightest trace of sand or clay, we need not search it in vain.

Very common throughout the whole area.

Widely distributed in Greenland without southern — and no doubt without northern limit too.

Always covered by snow and ice in the winter.

A 53. **Puccinellia retroflexa** (CURT.) HOLMB. apud LINDBMAN:
Svensk Fanerogamflora 1918 p. 97.

In ÖSTENFELD: Flora Arctica p. 127 GELERT, united a considerable number of Puccinellias, discerned by LANGE, under the name of *Glyceria distans* (L.) WAHL. But according to HOLMBERG's investigations this is erroneous, as the true *Puccinellia distans* (L.) Parl. does not occur at all in Greenland. Some of the plants, referred by GELERT and authors following him to this species, belong in fact to *P. retroflexa* (CURT) HOLMB. or rather to a subspecies *borealis* Holmb., still unpublished.

Of this new subspecies I have seen several sheets in H. H., labelled by Dr. HOLMBERG. According to that material the range of the plant will lie between the extreme south of Greenland and the southern parts

of our area, where it is very scarce. Hence it must be considered a southern type in West Greenland.

Not knowing *P. retroflexa* and its several forms myself, I cannot add any observations as to its occurrence.

About the remaining plants contained in the *Glyceria distans* of GELERT see the following numbers 54--56.

V 54. *Puccinellia angustata* (R. Br.) RAND & REDE.

At the sea-shore but also intermingled in the not-halophilous vegetation or occurring on the peat from previous land-vegetation now killed by the salt water; besides in all the places which agree with the var. *vaginata* and together with this variety.

A northern type, rather common on the coasts of Waygal. Besides from numerous localities around Disko-Bay becoming scarcer down the archipelago of Egedesminde; the southern limit is about 67°.

Abundantly flowering and fruiting.

Hibernates covered by snow.

**V 55. *Puccinellia angustata* var. *vaginata* (LANGE).
HOLMB. hoc loco!**

The most common *Puccinellia* in our area.

At the sea-shore, mostly on clayey, moist-sandy ground, or among other strand-vegetation; normally forming semi-globular cespits and the straw decumbent and closely pressed to the ground. Stands manuring very well, and in exceedingly manured soil, for instance at settlements or on small fowling-islets the tufts become hummocky and the newly hatched youngs of gulls and terns are able to hide in the channels under the leaves of the cespits.

Very common throughout the northern part of the area.

Like the preceding a northern type.

Flowers and fruits in great abundance.

Hibernates covered by snow and often by ice.

A 56. *Puccinellia arctica* (HOOK) FERN & WEATH.

By this name I understand a rather coarse grass, habitually differing widely from the preceding by its erect growth. It occurs on plains, raised marine clay, on clayey sandy terraces at the head of fjords and along the banks of the rivers falling into these.

Much scarcer than the preceding species because of the absence of suitable places; but covering extended areas when occurring, though not forming dense carpets as the foregoing.

One of the main-plants of the clay-plains in the interior, from the districts of Holsteinsborg to Disko Bay. Besides from some localities on the shores of Waygat.

Probably a southern type in West Greenland.

Abundantly flowering and fructificating.

| 57. **Puccinellia tenella** (LANGE) HOLMB. hoc loco!
(Incl. *Glyceria Langeana* BERL.).

In localities similar to those of the preceding species, rarer or overlooked because of its diminutiveness.

No doubt to be found in a great many places when only searched for.

Disko: In several places near Godhavn (P.).

Hare Ø (P.).

Mainland: From several localities in the Sydostbugt (Htz.; P.); the archipelago of Egedesminde: Kullen (K.); Kangâtsiaq (Bl.; K.); Augpilagtoq 68°44' (K.).

Abundantly flowering and fruiting.

Hibernates covered by snow.

| 58. **Festuca ovina** L.

In all sorts of soil from the most barren gravel and sand, in crevices between boulders and pebbles to heath, vigorous herb-mats, thickets and manured places.

Very common throughout the whole area.

Being common in the littoral halophilous zone of the coast, it ascends the hills to the snow-line.

Widely distributed in Greenland; if the rather much deviating *F. brevifolia* R. Br. is to be reckoned as a form of *F. ovina* the species has neither northern nor southern limit. Otherwise the northern limit has to be searched for somewhere at the shores of Melville Bay.

Very much variable, and numerous forms and varieties have been described. To be sure most of them are dependent upon the quality of the native place. I have not been able to elicit whether hereditary constant forms occur too or not.

Abundantly flowering and fruiting.

In many of the native places hibernating without cover of snow.

A 59. **Festuca rubra** L. var. **arenaria** OSB.

On fairly moist sand, for instance, along the shores of rivers and lakes; among other Gramineae in heath; at the base of dunes and often in manured soil or in thickets.

Often forming dense carpets.

Common throughout the whole area, but more isolated in the basalt-domain and the northern part.

A southern type, north of the area only known from a few localities, the northmost at 72°.

Undoubtedly a lowland-plant throughout the whole area.

Rather much variable, but not as much as the preceding one.

Abundantly flowering and fruiting.

Covered by snow during winter.

L 60. *Agropyron violaceum* (HORN.) LANGE.

On sand and sandy clay at the sea-shore, but also to be found at considerable distance from the coast; ascends to considerable altitudes.

Disko: Kūgānguaq (Th. Fr.); at Mudderbugt? (P.); the determination doubtful, the plant being observed on a sled-journey in the winter.

Mainland: The Waygal-coast of Nūgssuak-peninsula, common from Atā 69° 20' to Atanikerdluk (Th. Fr.; Htz.; P.). The tract of Holsteinsborg; Ikertōq Fjord 66° 50' (V.); Itiyneq about 67° (V.; W. & H.); hence not observed till 69° to 62°.

A decided southern type.

Abundantly flowering and fruiting.

Now and then snowless during winter.

A 61. *Elymus arenarius* L. var. *vilosus* E. MEY.

On sandy shores often forming dunes (cp. PORSILD: Medd. om Gr. 25 p. 135 ff. fig. 3-4); also in manured soil at the settlements and under, as well as on the fowling-cliffs; here often ascending to considerably altitudes. On Disko and Nūgssuak-peninsula very common in the basalt- and sandstone-domain, here being the most conspicuous plant of the sand-shore forming great dense growths.

More scarce on the rocky coasts of the gneiss-domain, but occurs in the smaller creeks ending in sand-formations. The plant is to be found far into the valleys of the fjords following the banks of the great rivers, but sometimes it is absent over great distances in the interior of the fjords owing to the lack of suitable conditions.

Commonly used by the natives for boot-straw when they cannot get *Calamagrostis Langsdorffii*.

A southern type only known from a few localities north of the area; the northmost at 70° 29' (P.).

Abundantly, but late flowering (at Disko-Bay) and only fruiting after favourable summers.

A decided winter-stander, but we have often found the unripened

grains in the spikes during the whole of winter. But an intense and patient search will always result in the finding of seedlings.

Normally only the spikes protrude above the snow.

XI. Cyperaceae.

I 62. **Eriophorum polystachion** L. (*E. angustifolium* ROTH.).

In moist moss-bogs and marshes along the shores of lakes and brackish lagoons, often in great quantities.

Very common throughout the whole area, but certainly not as widely distributed as the following species.

Very common in Greenland without southern or northern limit, ascends to considerable altitudes just as far as the bogs and pools are thawed up every day for at least a couple of months, even when they are covered with ice during the night.

F. *ferrugineum*? Bristles reddish, nearly as in *E. russeolum* Fr., upwards paler.

At Qámavík on the southern side of the Nordfjord I saw a great growth of f. *ferrugineum*, all the plants of which having rust-coloured bristles. The other species were growing just in the neighbourhood and partly mingled with it, but kept the normal colour of the bristles; I did not observe any intermediate forms.

Abundantly flowering and fruiting.

Hibernates covered by snow.

I 63. **Eriophorum Scheuchzeri** HOPPE.

In localities similar to those of the preceding species, still more common.

Note: The upper sheaths often somewhat swollen and perhaps this is the reason why such specimens in dried condition have been determined as *E. vaginatum* L., which species does not occur in Greenland.

It seems to be a pathological phenomenon due to the effect of the night-frost in the springtime. Phenomenons similar to this have been observed on various species of the Gramineae (comp. FR. BUCHENAU: 2. Deutsche Nordpolfahrt, II, 1, Botanik p. 53, who attributes this to another cause).

Abundantly flowering and fruiting.

Hibernates covered by snow.

A 64. **Heleocharis acicularis** (L.) R. BR. f. **submersa** H.J. NILSS.

Forming carpets at the borders of small, shallow, not quite dried-up lakes and ponds.

Disko: The north-eastern coast: Ingimongnaq 70° 17' (P.).

Mainland: Sarqaq about 70° (E. P.), Glashavn (Bg.); Christianshaab (Htz.) Orpigssuit (Htz.); Nivåq-Bugt 68° 32' (K.); Sofiehavn 68° 20' (Bl.).

Besides found a few times north of the area to 71° 42' (P.).

Though not found south of the area it is no doubt a decided southern type, overlooked because of its diminutiveness and undoubtedly to be found in several localities.

From all the localities the plant was quite sterile; at the north limit it was also found on desiccated soil, but without any trace of flowers. Thus it does not seem to have any power of dispersal.

Hibernates enclosed in ice.

A 65. **Scirpus caespitosus** L. (*Trichophorum austriacum* PALL.).

On moist spots in heath and moss-bogs or along the borders of small brooks; occurs isolated, but always in great quantities.

Disko: In several places on the southcoast.

Mainland: From Torssukáatak about 70° southwards from a great many localities as well in the inland as near the coast. From the fjords in the southern part of the area only from a few places, perhaps owing to the overlooking of the plant. We have not observed it neither in N. Stromfjord nor in the fjords inland from Holsteinsborg.

A southern type common south of 64° (Ros.) and north of the area quite isolated at 72° 27' (P.).

Ascending the hills to 4—500 m.

Abundantly flowering and fruiting.

Hibernates covered by snow and sometimes by ice.

I 66. **Cobresia Bellardii** (ALL.) DEGL. (*Elyna spicata* SCHRAD.).

Cobresia scirpina WILLD.).

On dry rock-ledges, bare spots in heath-vegetation and in gravelly places.

Disko: The southcoast in the gneiss area and at the coasts of Waygat in the sandstone-domain. Hitherto not observed on basalt; always scarce (P.).

Mainland: On the coast of Nùgssuaq peninsula from the sandstone-domain; from the gneiss-domain southwards here and there; the places forming a continuous area of distribution. In the southern part observed in Godthaab-fjord and 60°—61°; likely overlooked in the interjacent localities.

Widely distributed in West Greenland, though only found to about 71°; but being found, not only on the east coast north of this latitude, but also on either side of Smith's Sound, it is likely to occur on the interjacent part of the west coast.

Abundantly flowering and fruiting.

Undoubtedly snowless now and then.

I 67. **Cobresia lipartita** (ALL.) DALLA TORRE (*C. caricina* WILLD.).

On warm rock-ledges, sunny and rather dry heath and from the outskirt of thickets.

Disko: Lyngmarken at Godhavn $69^{\circ}15'$ (Th. Fr.).

Mainland: Here and there, but the rather numerous localities form together a continuous area of distribution; from the fjords inland from Holsteinborg following the interior part of the gneiss-land to Nûgssuaq peninsula and here only in the gneissic part northwards to the interior of the Nordost-Bugt.

The northmost locality is on Ubekendt Ejland $71^{\circ}12'$ (P.).

South of this domain known quite isolated at $64^{\circ}45'$. Otherwise not found till the southern coast of Ellesmere Land and on the east coast of Greenland at 71° and $73^{\circ}20'$.

Seems thus to be a northern type.

Abundantly flowering and fruiting.

Undoubtedly snowless now and then.

I 68. **Carex nardina** Fr.

In barren, sandy and gravelly places; on open heath and often characterizing this vegetation, but rare in stony soil.

Very common in the basalt and sandstone areas from the coast to the snow-line; scarcer in the gneiss-land and often absent in vigorous, dense vegetation of the lowland, but to be found on the hills or in barren places. This is especially the case in the great fjords, but occasionally also to be found here in the lowland for instance, on gravelly river-banks or on the slopes of marine layers of clay, where they have been cut through by streams.

Has neither southern nor northern limit in Greenland, but is scarce in South Greenland, and here it is to be reckoned as an Alpine species, only occasionally and by chance descending into the lowland.

Abundantly flowering and fruiting.

No doubt often snowless during winter. The living part of the plant, however, is very well guarded by the compact, involuted remains of the leaf-sheaths.

A 69. **Carex capitata** SOL.

In sandy soil, open spots on the heath, rock-ledges and clefts.

Disko: Only seen a few times in the gneiss-domain of the south coast (P.).

Mainland: Paotût $70^{\circ}12'$ (Htz.); from Torssukátak southwards there is a great many localities as well in the inland as, for instance, in the archipelago of Egedesminde. Nevertheless we did not see it in N. Stromfjord nor in the fjords inland from Holsteinsborg, though observed here several times by other collectors.

A southern type, north of the area only known from two localities in the interior part of the Nordost-Bugt.

Abundantly flowering and fruiting.
Undoubtedly snowless now and then during winter

I

70. *Carex incurva* LIGETI.

On sandy coasts, sometimes also in manured soil at the settlements.

Disko: The southeast at Godhavn $69^{\circ}15'$ (Th. P.) at some small bogs near a little lagoon.

It appeared at the Arctic Station, which lies a few hundred meters from the sea, after the building of the houses and grows now in mouldy manured soil along a drain and forms here a dense carpet. Rather common on Nord-Disko: Hare O.

Mainland: Waygal-coast of Nügssnaq peninsula. In the gneiss-domain isolated and scarce, for instance, Eeq 69°45' (P.); several places from the sandy shores around Sydost-Bugt (V.; Htz.; P.); Kangâtsiaq $68^{\circ}15'$ (Bgl.) and observed a few times in the surroundings of Holsteinborg.

In West Greenland known from 60° to 61° and from 65° to $71^{\circ}30'$, but besides from the coasts of Smith's Sound; no doubt often overlooked.

Even without flowers very easily distinguished from other species. But in nature it is not very conspicuous, not even with spikes, these normally being bent down and hid among the leaves.

f. erecta O. F. Lang seems to be a shade-form.

Abundantly flowering and fruiting.

Hibernates covered by snow.

I

71. *Carex pratensis* DREJ.

At the foot of a fowling cliff among other tall vegetation: Oeqertalik-Fjord, Naujarssuit $66^{\circ}44'$ (E. P.).

A decided southern and rare type, for the rest only known from a few places in Godthaabfjord and Tunugdliarfik. The above mentioned locality thus the northern limit of the species.

Here abundantly flowering.

Hibernates covered by a thick layer of snow.

A

72. *Carex Macloviana* d'URV. (*C. festiva* DEW.).

On fertile heath-slopes, herb-mats and in thickets.

Disko: The south coast around Godhavn $69^{\circ}15'$ several localities; rather common (P.); Diskofjord at Kuánerssuit $69^{\circ}35'$ (P.).

Mainland: Sarqaq 70° (V.); Pâkitsoq $69^{\circ}28'$ (Sor.); Egedesminde (W. & H.); S. Kangerdluarssuk (W. & H.); Holsteinsborg several localities (Th. Fr.; W. & H.).

A decided southern type, the known northern limit of which has been mentioned above.

In South Greenland it becomes gradually common and is also to be found at some considerable altitudes (Ros.).

Abundantly flowering and fruiting.
Hibernates covered by a thick layer of snow.

I

73. *Carex canescens* L.

Disko: In 1908 I collected a *Carex*-species at Kûgaq at Mudderbugt; it was noticeable because of its stature and vigour and by the pale, rather small, remote spikelets. With some doubt I have determined it to *C. canescens* though the beak of the outricles are somewhat too long and resemble that of *C. lagopina*. I brought some of the tuft away with me and planted it at home, and it has retained its aspect unchanged since, but now it is gradually overcome by the surrounding vegetation.

Mainland: In Kangerdluarssuk (W. & H.); Ikertôq Fjord 67°50' (V.).

A decided southern type. The above mentioned locality being its northern limit.

South hereof only observed a few times; from 60° to 61° however being rather common (Ros.).

Flowers and fructificates.

Hibernates covered by snow.

I

74. *Carex brunnescens* (PERS.) POIR (*C. vittata* FR.).

Among grass, in thickets.

Mainland: Holsteinsborg, 66°55' (Th. H.).

S. Kangerdluarssuk 67° (W. & H.); Ikertôq Fjord 66°50' (V.).

A decided southern type, the above-mentioned locality being the north limit.

The distribution resembling that of *C. canescens*, but, according to ROSENVINCE, somewhat more frequent and undoubtedly common from 60° to 62°.

Flowers and fructificates.

Hibernates covered by snow.

A

75. *Carex lagopina* WAHLNB.

On vigorous heath, herb-mats, thickets and rock-ledges.

Very common throughout the whole area following old vegetation. Ascends the hills, but does not belong to the pioneers on new-gained soil, for instance, moraine etc.

Widely distributed in Greenland, particularly a southern type, The north limit at about 73°.

Abundantly flowering and fruiting.

Hibernates covered by snow.

i

76. *Carex glareosa* WAHLER.

At the shore among other vegetation.

When having room enough it forms dense carpets or marshes along the shore, for instance, at the borders of lagoons inland from the beach.

C. glareosa grows, just like the other plant characteristic of the shores of Disko Bay, *Puccinellia angustata* v. *raginata*, in semi-globular tufts with the fruiting stalks lying densely pressed to the ground and radiating in all directions. Stands manuring very well.

Very common throughout the whole area; attaining its highest development when the shore consists of sand or clay.

Widely distributed in Greenland without known northern or southern limit; the northern limit likely to be found at some place near Smith's Sound.

Abundantly flowering and fruiting.

Hibernates covered by snow and often by ice.

v

77. *Carex ursina* DEW.

On moist sand at brackish lagoons at the shore, sometimes in rather extended patches.

Disko: The south coast at Godhavn $69^{\circ}15'$ (E. P.); Maligiaq at the mouth of Diskofjord $69^{\circ}25'$ (Th. Fr.); at the head of Nordfjord various places $69^{\circ}50'$ — $55'$ (P.); the Waygat-coast Únartuarssuk (Nath.); Ivnárssukasik $70^{\circ}10'$ (P.).

Hare Ø (P.).

Mainland: The coast of Nügssuaq peninsula from Marraq north of the great river down to Atanikerdluk (P.), several localities: Eqe $69^{\circ}42'$ (P.); Claušhavn (S. H.); Orpigssuit (Htz.); Egedesminde (Bl.); Itivneq (W. & H.).

A decided northern type, the last mentioned locality being the south limit in West Greenland. North of the area found at Niaqörnaq $70^{\circ}47'$ (V.) then not till Ellesmereland (Simmons), but no doubt overlooked from the interjacent part of the coast.

Abundantly flowering and fruiting.

Hibernates covered by snow and ice.

A

78. *Carex gynocrates* WORMSKJ.

Disko: Osterdalen (Nyg.) Blæsedalen (Th. P.), Skarvefjeld at Godhavn $69^{\circ}17'$ (Th. Fr.); Skansen $69^{\circ}25'$ (Rikli).

Mainland: Claušhavn $69^{\circ}5'$ (Bg.); Ikamiut $68^{\circ}37'$ (Bl.); Tasiussarssuaq $68^{\circ}23'$ (Bg.).

A decided southern type, rare from all localities (perhaps overlooked) in Greenland.

The above-mentioned localities represent the north limit; south

of the area also seen but a few times. The record from $81^{\circ}40'$ (BESSELS: ASA GRAY) seems very doubtful, no doubt owing to confusing of the material.

Flowers and fructificates.

A 79. *Carex alpina* Sw. (*C. Halleri* GUNN.).

On fertile spots in the heath, in bogs, moist herb-mats, thickets and rock-ledges.

Disko: From the south coast: Diskofjord and Mellemfjord and the adjacent valleys, from small creeks between the two fjords; common (P.). From the southern part of the Waygat-coast, but hitherto not observed on the northland and the great valleys here.

Mainland: A continued area from the tract of Holsteinsborg along Disko Bay over the interior gneissic tract of Nügssuaq peninsula to the inner part of the Nordost-Bugt. Here common everywhere at some distance from the outer coast, and ascending, in localities favourably exposed to the sun, to considerable altitudes.

A southern type, common southwards, but in the mentioned area only from few places, the northmost at $72^{\circ}22'$ (P.).

Abundantly flowering and fruiting.

Hibernates covered by snow.

I 80. *Carex holostoma* DREJ.

In moist bogs and along lake-shores.

Disko: The south coast at Godhavn $69^{\circ}15'$ and in the valleys here rather common (Th. Fr.; P.).

Mainland: From Igdlularssuit $69^{\circ}50'$ down to Tasiussarssuaq $68^{\circ}28'$ observed at many places and no doubt common. Archipelago of Egedesminde: Egedesminde Ø $68^{\circ}42'$ (V.; Bl.; P.); the southern side of Qeqertarsuatsiaq $68^{\circ}23'$ (P. & E.).

The last mentioned locality hitherto the south limit. We searched for it in the southern fjords, but in vain. Northwards recorded from Úmánaq (V.) and Proven $72^{\circ}20'$ (Hart.).

No more than NOTO (Indre og Mellem-Kvænangens Karplanter. Nyt Magazin f. Naturv. 40. 1902 pag. 351), I have seen transition forms between this and the preceding species, and I quite agree with the above author as to their having quite different habitats and modes of living.

Abundantly flowering and fruiting.

Hibernates covered by snow.

I 81. *Carex rariflora* (WAHLENB.) SM.

Generally in moss-bogs and moist heath, but also on herb-mats with abundant and long-lasting snow-cover; now and then in thickets.

Very common throughout the whole area.

Widely distributed in West Greenland, without southern limit; the northern limit not known, but lying somewhere north of 73° .

Ascends the hills following the continuous vegetation.

Abundantly flowering and fruiting.

Hibernates covered by snow.

V 82. **Carex stans** DREJ. (*C. aquatilis* var. *stans* BOOTT.; OSTENFELD).

Character-plant of the *Carex*-bogs, along lake-shores growing in company with *Eriophora*, *Carex palla*, *C. rotundata*, *C. rigida* var. *concolor* (Cp. Porsild I. c. 167 ff. Fig. 10–11 Resumé 280).

Disko: Very common everywhere, ascending the hills to at least 600 m. (P.).

Hare Ø (P.); Mainland: Nügssuaq peninsula and from Torsukatik down to the Sydost-Bugt common; evidently somewhat scarcer in the gneiss-domain than in the basalt. Egedesminde (V.); the continent at $68^{\circ}30'$ (P. & E.).

According to OSTENFELD: Fl. Arctica these last localities represent the southern limit of the species here in West Greenland.

Thus it is a northern type; known from Ellesmereland and is likely to be found from the interjacent coast north of the Danish settlements.

Often the species is difficult to distinguish from the closely allied *C. rigida*, *C. palla*, *C. rotundata*.

In addition to the characters already mentioned in the literature we may add the colour of the old sheaths of *C. stans* usually being *light-brown* and *dull*, while that of the other species is more or less purple-coloured and shining.

Abundantly flowering and fruiting.

At the beginning of the winter a decided winter-stander; later on thickly covered by snow.

A 83. **Carex subspathacea** WORMSKJ. (*C. salina* var. AUTT.).

On strand-meadows and strand-rocks among other halophilous vegetation; very small and insignificant and no doubt often overlooked. Only exceptionally forming carpets along the brackish lagoons.

Disko: At Godhavn, Udkiggen $69^{\circ}12'$ on splashed strand-rocks (P.); Mellemfjord about $69^{\circ}45'$ (Rikli!); Hare Ø $70^{\circ}20'$ (P.).

Mainland: Kugsinerssuaq $70^{\circ}15'$, forming extensive patches (P.); Augpalârtoq north of Kangâtsiaq (K.); Ikertôq Fjord at Holsteinsborg (V.).

A southern type. The above mentioned localities represent the northern limit, but it is hardly the real one, the plant in East Greenland being found far north of this latitude.

Abundantly flowering and fruiting.
Hibernates covered by snow and ice.

I 84. **Carex rigida** GOOD. and var. **concolor** R. BR.

The main-species on heath, herb-mats, thickets and in stony soil ascending the hills to considerable altitudes.

The variety: in very moist bogs and especially at lake-shores; generally in the lowland.

Both very common throughout the whole area.

Widely distributed in Greenland with neither southern nor (the main-species) northern limit.

Abundantly flowering and fruiting.

The variety thickly covered by snow and often by ice during winter. The main species certainly snowless now and then.

I 85. **Carex rufina** DREJ.

On moist sand, partly inundated during the early part of the summer.

Disko: In a little pool near Godhavn $69^{\circ}15'$ (Th. P.!) very rare.

Mainland: N. Isortoq $67^{\circ}15'$ (V.).

A decided southern type, perhaps often overlooked. The mentioned locality indicates the northern limit. Found a few times in South Greenland.

Flowers and fructificates.

Hibernates covered by snow and ice.

A 86. **Carex bicolor** ALL.

On moist sand along the shores of lakes and rivulets; on barren spots of sand and clay in the heath.

Disko: Several localities at Godhavn $69^{\circ}15'$ (Rikli; Th. P.; P.), at the foot of Ingigsoq at the Waygat $69^{\circ}45'$ (P.).

Mainland: Lerbugt at Claushavn (Bg.); Qeqertarssuatsiaq (the southern side) $68^{\circ}23'$ (P. & E.); Kangerdluarssuk at Agto $67^{\circ}69'$ (E. P.!).

Everywhere very scarce, often only in single tufts.

A decided southern type; scarce (or overlooked) throughout Greenland; south of the area only found a few times, to the north of it found at the interior of Nordost-Bugt $70^{\circ}32'$ (Vh.).

Abundantly flowering and fruiting.

Hibernates covered by snow.

i

87. *Carex scirpoidea* Michx.

In mouldy and peaty soil; in vigorous heath, herb-mats, thickets and rock-ledges.

Very common throughout the whole area.

Widely distributed in Greenland, without southern limit, being observed till $72^{\circ}20'$; the north-limit is not known.

Ascending the hills following the old dense vegetation.

Abundantly flowering and fruiting.

Hibernates covered by snow.

Carex deflexa Horn (*C. piluliferae* var. Autt.).

Recorded from Rode-Bay $69^{\circ}20'$ by SØRENSEN; probably an error.

A decided southern type, only found a few times in South Greenland chiefly between 60° and 62° ; the northmost at $65^{\circ}25'$.

v

88. *Carex rupestris* All.

On dry heath, in stony soil and on rocks.

Very common in the northern part of the area; and in the archipelago of Egedesminde we found it frequently. Recorded from many places in the fjords inland from Holsteinsborg.

A northern type, the distribution of which north of $72^{\circ}30'$ is not well known; (recorded from Ellesmereland, but scarce (Simmons).

The southern limit of its continuous distribution is to be settled in the tract of Holsteinsborg. South hereof recorded quite isolated from Godthaab $64^{\circ}11'$ (Sor.).

Abundantly flowering and fruiting.

Often snowless during winter.

i

89. *Carex supina* WAHLENB.

On vigorous heath, sunny gneiss-slopes and the margin of thickets.

Disko: Diskofjord near Ikineq $69^{\circ}28'$ several times (P.).

Mainland: Numerous localities between Torsukátab and Sydost-Bugt; from here southwards rather common; from the interior of the fjords, thus from many places in N. Stromfjord (P. & E.), becoming frequent southwards.

Widely distributed species, but probably with north-limit somewhere in West Greenland; hitherto known to about 73° .

Abundantly flowering and fruiting.

Surely covered by snow during winter.

i

90. *Carex pedata* WAHLENB.

In similar localities and with a similar distribution, perhaps somewhat scarcer.

Disko: South coast at Godhavn and Mudderbugt (P.); Eqaluit and Nordfjord (Th. Fr.); Ujaragsugssuk at Waygat (Nath.).

Mainland: Sarqaq, Ritenbenk, Pákitsoq (V.); Eqe (P.); Jakobshavn (V.); N. Stromfjord: Ungôriarfik (Korn.); N. Isortoq (V.).

Abundantly flowering and fruiting.

No doubt covered by snow during winter.

V 91. Carex misandra R. Br. (*C. fuliginosa* HOOK.).

On heath, rocks and fell-field.

Disko, Hare O, Mainland north, east and south of Disko Bay ascending the hills to considerable altitudes, very common. Then becoming scarcer. Not recorded by Kruuse and not observed by us in the archipelago of Egedesminde. In N. Stromfjord scarce on the northern coast; from Eqaluarssuit on the south-coast (P. & E.) but not elsewhere; not even on the hills.

N. Isortoq and Holsteinsborg (V.); Maligiaq and Itivneq 66°58' (P. & E.); Naujarssuit; Qeqertalik Fjord 66°46' (P. & E.).

A northern type; the last mentioned localities indicates the known south-limit.

Abundantly flowering and fruiting.

Undoubtedly always covered by snow during winter.

V 92. Carex ustulata WAHLENB.

A rare (or overlooked) northern type, only found once at the northern limit of the area at Marraq north of the great river on Nùgs-suaq peninsula (P.); north hereof only from a few localities.

Abundantly flowering and fruiting.

i 93. Carex capillaris L.

In open spots on heath and fell-field and on rocks.

Very insignificant and therefore often overlooked. Not especially noticed in our diaries, but probably common throughout the whole area; always to be found when intentionally searched for.

Widely distributed in Greenland, but perhaps with a north limit somewhere at Melville-Bay. Known from north of 74°, and scarce from Jones Sound (Simmons).

Abundantly flowering and fruiting.

Not always covered by snow in winter.

A 94. Carex microglochin WAHLENB.

At edges of moist flat rocks, among moss and algal growth; everywhere rare or overlooked.

Disko: Hitherto not found.

Mainland: Imilik at the ice-fjord of Jakobshavn 69° 10' (Th. P.). Glashavn (Bg.); Lerbugt (Htz.); Orpigssuit (Htz.); N. Stromfjord; Ivnalik 67° 44' (P. & E.); Head of Hvaddeq fjord, 66° 29' (P. & E.).

Decidedly a southern type; north of the area found twice; the northmost locality at 70° 40' (V.).

Flowers and fructificates.

Undoubtedly covered by snow during winter.

A

95. *Carex rotundata* WAHLNB.

In marshes especially on lake-shores.

Disko: The south coast, at Godhavn here and there; Mudderbugt (P.).

Mainland: Several places between Sarqaq 70° and Sydost-Bugt, but not common; hitherto not collected or reported from the district of Egedesminde, neither from the archipelago nor from the fjords inland from Holsteinsborg.

A southern type, the known north limit of which is at Ikerasaq 70° 35'.

Plant of the lowland.

Abundantly flowering and fruiting.

Hibernates covered by snow and often by ice.

I

96. *Carex pulla* Goop. (*C. saxatilis* L.).

In swampy bogs, at lake-shores often forming extensive patches together with *C. stans*, *C. rotundata*, *C. rigida* var. *Bigelowii* and *Eriophora*.

Disko, Hare Ø, Nügssuaq peninsula and Mainland around Disko Bay very common (P.). Still more frequent in the north-district of Egedesminde, but then getting scarcer southwards. N. Stromfjord: Sarfarssuaq 67° 49' (P. & E.); S. Kang-erduarssuk (W. & H.); Holsteinsborg (V.).

A northern type, being rare south of the area; according to OSTENFELD known to about 64°. Northward collected rather continuously to 72° 45', and this does not seem to be the north-limit. Mostly a lowland plant.

Abundantly flowering and fruiting.

Hibernates covered by snow and often by ice.

XII. Juncaceæ.

A

97. *Juncus arcticus* WILLD.

On moist sand and sandy clay at the shores of lakes and rivulets, on open spots in bogs often among halophilous vegetation.

Sometimes in herb-mats and thickets.

Disko: Locally, but from many localities on the south coast, the fjords and from the inner part of the great valleys; scarce on the northland and hitherto not found on the north-east coast.

Hare Ø (P.).

Mainland: Holsteinsborg several places, but not common. From the south-district of Egedesminde rather common. From the archipelago of Egedesminde recorded as "rather common" by KRUUSE; according to our opinion rather scarce.

In the district of Christianshaab and in the tract to the south of that numerous localities. Rare in the district of Jakobshavn; Jakobshavn (V.); Atå (P.); Eqe (P.); from several places on the Waygat-coast of Nügssuaq peninsula.

A southern type, north of the area only recorded from the inner part of Nordost-Bugt at Ikerašak; Úmánaq and at Igdlorssuit on Ube-kendt Ejland $71^{\circ}15'$, this place the north limit of the species.

Lowland plant, not ascending to any considerable altitude.

Abundantly flowering and fruiting.

In the first part of the autumn winter-stander; later on covered by snow and often by ice. Never snowless during winter.

I 98. **Juncus bulbosus** L. (*J. spinus* MOENCH).

In loose mire at the borders of shallow ponds, very rare (no doubt often overlooked because of its diminutiveness).

Mainland: District of Christianshaab: Orpigssuit $68^{\circ}39'$ (Htz.); district of Egedesminde: the southern side of Sarqardlit $68^{\circ}37'$ (P. & E.).

A southern type; according to GELERT (Ostenfeld: Fl. Arctica), found besides at $60^{\circ}55'$.

The three localities near the coast, the plants small and quite sterile.

Hibernates enclosed in ice.

A 99. **Juncus castaneus** SM.

On moist sand and clay, at the shores of lakes and rivulets, on open spots in bogs, often among halophilous vegetation; rarer among the mosses of bogs and from herb-mats.

Rather common throughout the whole area. From the district of Egedesminde KRUUSE states it as "rare", but this only applies to the outmost islets of the archipelago.

A southern type, north of the area getting scarcer, limited to places far from the outer coast. The known north limit from the interior at Laksefjord $72^{\circ}20'$. Likewise it seems to become rarer southwards; south of 63° only known at the terminal moraine of Frederikshaabs Isblink $62^{\circ}30'$; probably alpine or descended here.

Abundantly flowering and fruiting.

At the beginning of the autumn winterstander; later on thickly covered by snow and often by ice.

i

100. *Juncus triglumis* L.

On moist sand and clay at lake-shores, and on open spots in bogs and heath.

Undoubtedly common throughout the whole area, but often absent from lists of plants owing to overlooking.

Rather a southern type, the north limit of which is not known. To $70^{\circ}45'$ we have specimens and verified records. My previous record from $72^{\circ}30'$ is apparently incorrect (Medd. om Grønld. 50, p. 371), owing to an erroneous determination.

Ascending to 5—600 m.

Abundantly flowering and fruiting.

Hibernates usually abundantly covered by snow and often by ice.

I

101. *Juncus biglumis* L.

On moist sand and clay, often on bare spots in bogs and heath; scarcer among taller mosses and other vegetation.

Very common throughout the whole area. From the archipelago of Egedesminde recorded by KRUUSE as "rare" but that does not agree with our observations.

Ascending the hills to the snow-line; in tracts of dense vegetation often found ascended or on the shady side.

Widely distributed arctic plant without either southern nor northern limit in Greenland.

Abundantly flowering and fruiting.

Hibernates covered by snow.

Λ

102. *Juncus trifidus* L.

On dry and sunny rock-ledges among other vegetation, sometimes on gravel or in herb-mats; seems to be rarer on basalt than on gneiss and sandstone.

Disko: The south coast, at Godhavn rather common and from Mudderbugt to Ingigsøq $69^{\circ}45'$ (P.).

Mainland: Rode Bay $69^{\circ}20'$? (Sor.). From the archipelago of Egedesminde reported by KRUUSE as "common"; no places are indicated and we have not re-found it here. N. Stromfjord: Ivnalik $67^{\circ}47'$ (P. & E.), N. Isortoq $67^{\circ}20'$ (Ros.) and S. Kangerdluarssuk $67^{\circ}0'$ (W. & H.).

Southern type, the above-mentioned localities represent the known north limit.

Lowland plant.

Abundantly flowering, but at Godhavn, for instance, not fruiting every year.

Often snowless; but the living parts of the plant always covered during winter.

J 103. *Juncus bufonius* L.

On moist spots of clay, and especially at the lower edge of bare, flat gneissrocks.

N. Stromfjord from Ipiutarssuaq along the southern side of the branch to Sarfarssuaq $67^{\circ}45'$ observed from several places (P. & E.).

We were highly surprised by finding this plant here, being hitherto only known from paths at the old Norse-ruins at Igaliqo (about 61°).

On the map in Medd. om Grønld. 15 tab. XII an old ruin is marked off at Itivdlerssuaq, the passage from Nuerssorfit to Arfersiorfik. According to informations from the natives in the district there really is a big ruin, but no doubt of Eskimoic origin. Thus, according to the absence of Norse-ruins here, it is unlikely that the plant has been introduced by the Norsemen.

The specimens were very small; from simple, only one centimeter high, single-flowered specimens, to specimens 3 centimeter high, ramified from the ground, these bearing 1—3 flowers.

Normally flowering.

A 104. *Luzula parviflora* (EHRH.) DESF.

In herb-mats and as undergrowth in open coves; on Disko often in the neighbourhood of the hot springs; often forming extensive patches.

Disko: The south coast and the valleys here between Laksebugt and Mudderbugt, about $69^{\circ}45'$ (P.).

Diskofjord, on the north coast and at the hot springs on the south coast (P.).

Eqaluit, $60^{\circ}30'$ (P.); Mellermfjord: the north coast at Kuánit and Ikorfarsuit, $69^{\circ}45'$ (P.).

Mainland: (Strange to say not recorded from the district of Christianshaab). Egedesminde? (Sor.) in vain searched for by us (E. & P.); Augpalártoq north of Kangâtsiaq, $68^{\circ}25'$ (Kr.); Kangerdluarssuk east of Agto, $67^{\circ}59'$ (E. P.); N. Stromfjord near Gieseckes lake (Korn.); Eqaluarssuit, $67^{\circ}36'$ (P. & E.), (in the interior part of the fjord not observed by us!) N. Isortoq (V.); Holsteinsborg: from several places in the fjords, especially from the interior (W. & H.); (P. & E.).

A southern type, the above-mentioned places representing the north limit in West Greenland, $68^{\circ}25'$ for the mainland, $69^{\circ}35'$ for Disko. Common in South Greenland.

Lowland plant, only ascending to inconsiderable altitudes.

Abundantly flowering and fruiting. When the snow falls in the

autumn the big inflorescences are filled with snow and the thin stalks break; thus not winter-stander. All the habitats are covered by a thick layer of snow during the winter, but favourably exposed as to the melting of the snow in the spring-time. Var. β *sparsifolia* Lange, is a shade-form from the copses.

A**105. *Luzula spicata* (L.) DC.**

On heath, herb-mats and copses

Rather common, though not everywhere, throughout the whole area, usually at some distance from the shore and in fairly favourable places. KRUSE records it from the archipelago of Egedesminde as "very rare"; but this applies only to the small outer islets; in the interior of the greater islands and in the fjords the plant is not rare.

The north limit of the species is not known, but in favourable places the plant is surely to be found till $72^{\circ}30'$; the records from the district of Cape York have proved themselves erroneous determinations.

At Disko-Bay and north hereof usually lowland plant though ascending to 600 m in favourable places.

Abundantly flowering and fruiting.

Winter-stander, the basal shoots being covered by snow during the winter.

I**106. *Luzula confusa* LINDEB. (*L. arcuatae* var. AUTT.).**

On heath and on fell-field, very common throughout the whole area except in vigorous and dense lowland vegetation. Ascends the hills to the snow-line; also on the Nunataqs above the glaciers of Disko.

Widely distributed arctic plant.

Flowers and fruits abundantly.

Specimens from our area determined by other authors as *L. arcuata* are, in our opinion, not typical.

V**107. *Luzula nivalis* (LAEST.) BEURLIN.**

On Disko, Hare Ø and Nûgssuaq peninsula common on the hills and in deserted places in the lowland. Recorded from numerous places in the gneissic area of Disko-Bay; Kruuse records it from the archipelago of Egedesminde as "very rare" and this is undoubtedly right; still it has been collected at Manermiut (Bg.); Qeqertarssuatsiaq $68^{\circ}23'$ (P. & E.), on the Mainland at $68^{\circ}30'$ (P. & E.); Kangertluarssuk east of Agto $67^{\circ}59'$ (E. P.). In N. Stromfjord collected by KORNERUP, but not re-found by us; in Ikertôq Fjord (V.); Sarfânguaq (V.; P. & E.).

A northern type, the known south limit at about $64^{\circ}30'$.

Usually abundantly flowering and fruiting.

Often snowless during winter.

A 108. *Luzula frigida* (BUCH.) SAMUELSSON (*L. multiflora* AUTT. non EHRH.).

In copses, herb-mats and vigorous heath.

Disko: On the south coast; in the fjords and the big valleys rather common in favourable places in the lowland. Not observed on the north and north-east coast.

Mainland: In the gneissic area of Disko-Bay rather common. As to the archipelago of Egedesminde KRUTSE states: "rare", but this is only the case on the outermost and small islets; we (P. & E.) found it on the southern side of Sargardlit $68^{\circ}39'$; on the mainland at $68^{\circ}30'$; Qeqertarssuaq (the southern side) $68^{\circ}23'$; Kangerdluarssuk east of Agto and common in N. Stromfjord and its ramifications. Very common in the district of Holsteinsborg (P. & E.)

Certainly a southern type; north of Disko-Bay from a few places to $72^{\circ}30'$ this temporally being the north limit of the species.

Usually lowland plant only ascending to inconsiderable altitudes.

Abundantly flowering and fruiting.

Covered by snow during the winter.

NB. The referring of the plants from our area to *L. frigida* instead of to *L. multiflora* is due to Dr. G. SAMUELSSON who revised the material in H. H.

XIII. Liliaceae.

I 109. *Tofieldia palustris* Huds.

In moss-bogs and moist spots in the heath, sometimes in herb-mats and copses, but not, as stated by Rowlee and Wiegand l. c. p. 423, "on sand along the shore". Very common throughout the whole area.

Widely distributed species, the north limit of which is yet unknown. It has been observed till north of 74° , but the records from north of Cape York wants confirming.

Ascends the hills following the dense growth of vegetation.

Flowers and fruits abundantly.

Covered by snow in winter.

V 110. *Tofieldia coccinea* RICH.

This rare plant, hitherto only known from four places in the Nordost-Bugt (between $70^{\circ}30'$ and $71^{\circ}45'$) and from three places in East Greenland (between $70^{\circ}30'$ and $76^{\circ}30'$), was unexpectedly found by us in the interior of N. Stromfjord from Ipiutarssuaq $67^{\circ}42'$ towards Sarfarsuaq almost everywhere, growing among tall mosses on the very vigorous heath of the lowland; besides in several places on a hill in the narrow passage between the Qarssorsaq-arm of this fjord and Arfersiorfik $67^{\circ}55'$ ascending to 3—500 m.

In spite of the occurrence here the species must be settled as a northern type immigrated to Greenland from the North. No doubt

it is more common northward and surely overlooked, being difficult to distinguish, in sterile state, from the preceding species.

Here abundantly flowering; some of the specimens had a height of 15-20 cm. We also saw old fruitstalks.

In all the places seen by us, the plant was no doubt covered by snow during the winter.

XIV. Orchidaceae.

I 111. **Habenaria hyperborea** (L.) R. Br. (*Limnorchis major* (LANGE) RYDB.).

In vigorous herb-mats and open copses, especially at the hot springs.

Disko: The south coast at Godhavn found in several places and by several collectors. Diskofjord: Únartoq 69°25' (Krogh!), Kuñersøq 69°33' (P.), and just opposite Qárusuit 69°32' (P.).

Mainland: District of Holsteinsborg: Naujarssuit in Qeqertalik-Fjord 66°45' (P. & E.).

A decided southern type, from hence not known till 64°14' and according to ROSENVINGE not common till south of 63°. The above-mentioned localities thus represent the northern limit on the mainland and Disko.

All the mentioned places are in the lowland.

Abundantly flowering and fruiting.

Covered by snow in winter.

I 112. **Habenaria albida** (L.) R. Br.

In places similar to those of the preceding species and often growing in company with it.

Disko: The south coast near Godhavn 69°15—16' in several places and collected by several people. Diskofjord just opposite Qárusuit 69°32' (P.).

Mainland: Imilik at Jakobshavns Isfjord (Sør.), here searched for in vain by us; no doubt a confusion with Imilik in Godthaab-fjord (SØRENSEN also collected here!). Ikertóq-Fjord 66°50' (Rink); Qeqertalik 66°45' (Brunnerstedt). South of 65° common, according to ROSENVINGE.

A decided southern type; the above-mentioned places represent the north limit; all the places in the lowland.

Flowers and fruits abundantly.

Covered by snow during winter.

I 113. **Listera cordata** (L.) R. Br.

Disko: The south coast, among the herbs within the area of hot springs in Engelskmandens Havn at Godhavn 69°15'; first found by HOLBØLL, afterwards by numerous collectors.

Diskofjord: Opposite Qárusuit 69°32' (P.).

A decided southern type, on the mainland from a few places in Godthaab-fjord till $64^{\circ}30'$ and not very common at 60° — $62'$ according to ROSENVINGE.

All the mentioned places are in the lowland.

At Godhavn usually not flowering, only during favourable, i. e. damp and moist summers, but then abundantly.

We found unripened fruits in August 1917.

Under a thick cover of snow in the winter.

L 114. *Corallorrhiza trifida* (L.) CHATEL. (*C. innata* R. BR.).

In vigorous herb-mats and near hot springs.

Disko: Engelskmandens Havn $69^{\circ}15'$ (Sor.) 1891, not re-found; in Disko-fjord at Kuánerssuit (Th. Fr.).

A decided southern type. On the mainland known from N. Isortoq $67^{\circ}15'$ (V.); southwards not till Godthaab-fjord.

The above-mentioned specimens from Engelskmandens Havn are flowering.

Covered by snow in winter.

Dicotyledones.

XV. Salicaceae.

i 115. *Salix herbacea* L.

In bogs and moist spots in the heath, among stones in the outlets of springs; very typical for places where the snow-cover lasts long.

Very common throughout the whole area.

Widely distributed in West Greenland without south limit; the north limit is unknown, no doubt to be found north of 76° .

Ascending the hills to considerable altitudes, though not in newly formed mineral soil.

Abundantly flowering and fruiting.

Hibernates covered by a thick layer of snow and often besides by ice.

L 116. *Salix Myrsinifolia* L. var. *parvifolia* AND.

S. ivigtutiana LUNDSTR., *S. Uva Ursi* PURSH sec. SCHNEIDER.

Recorded from Ritenbenk $69^{\circ}45'$ (V.) and from Jakobshavn $69^{\circ}13'$ (V.).

A decided southern type; not known till $64^{\circ}48'$ in the Godthaabs-fjord; and it is possible that the above-mentioned specimens may prove themselves to be something else, for instance, a hybrid between the other species.

i 117. *Salix groenlandica* (AND.) LUNDSTR. (*S. arctica* var. *Actea*).

In moist soil. In bogs and moist heath, at water-courses, often in river-deltas washed down from alpine habitats; ascends the hills following the rivers from the glaciers and the snow-fields.

Often pioneer on recently denuded moraine or alluvial soil.

Very common throughout the whole area.

Widely distributed in West Greenland, without south limit; in the extreme north perhaps replaced by other varieties of *S. arctica*.

Under identical conditions this species flowers before the following and is abundantly fruiting.

Normally covered by snow and often by the ice of the springs; perhaps snow-less now and then when growing on the hills.

i 118. *Salix glauca* L.

Forming copses in places favourably exposed to the sun, if only abundantly covered by early melting snow, and provided the following summers being warm and damp. Thus often on the sunny side of rocky walls, these lying sheltered from the wind.

Besides it is always present in the heath-vegetation, both in the dry part and in the moist. It is to be found in bogs right down to the lake-shores and is sometimes growing in the most dry and barren places, dunes, gravel among boulders and stones, on rock-ledges and in crevices.

Very frequently used as fuel by the natives. The bushes are pulled up in the summer and stacked to dry for the winter.

Very common throughout the whole area.

Widely distributed in West Greenland without southern limit. The north-limit is not known, but undoubtedly to be searched for north of 76°.

Abundantly flowering and fruiting, except in the most barren places.

In many places snowless. But to the copses the snow-cover is absolutely necessary. The long shoots, projecting above the snow, are usually dying, the copses thus resembling clipped hedges.

Nevertheless the copse- and espalier-willow is able to stand the night-frost, even when the buds and shoots are denuded of snow, if only the growth of these have not yet begun.

The willows of Greenland are much varying, especially *S. glauca* and *S. groenlandica*. A great part of the variations are directly dependent on the quality of habitat, and various parts of the same specimen often have various forms of leaves. But besides these variations there

often occur others which are not due to the ecological conditions, and they seem to be heritable constant.

In every copse of considerable extension several forms occur, now forming small groups, now growing scattered in the copse.

I have only mentioned above the main-species and none of the numerous varieties described and named by previous authors, because I am well aware of my deficiency of ability and my lack of information and also of my shortage of figures and of properly determined material for comparison.

The various highly interesting papers on Arctic Willows by C. K. SCHNEIDER (Botan. Gazette 66–67) came to my knowledge after having handed in my MS. to the printer, and consequently I have not been able to utilize them here.

XVI. Betulaceae.

119. *Betula nana* L.

On heath and not too moist bogs. Usually one of the most important plants of the heath and in places it becomes dominant and plainly forms ‘birch-heath’. Besides forming espaliers against boulders. Less frequently forming small birch-copse sheltered by willow-copse.

In places, which are warm in summer and sufficiently covered by snow during the winter and especially in valleys far from the coast, it is able to rise from the ground with the branches above the other plants of the heath; this is the case as well at 72° n. l. as south at 67°.

Very common throughout the whole area, though not everywhere. As well at the southern as in the northern part of the area, for instance, on Disko and Nûgssuaq peninsula, one may sometimes walk for miles without seeing a single specimen of *Betula*.

It cannot be the climatic conditions which causes this scarcity. I should rather think the lack of the commensals necessary for the roots was the reason for this.

The larger specimens are collected on a large scale by the natives who use them for fuel.

Widely distributed in Greenland; the south limit at 63° (Ros.). The northern limit unknown, but to be searched for north of 74°30'.

Abundantly flowering and fruiting.

Hibernates normally covered by snow, but in unfavourable places the snow-cover periodically may be absent.

I 120. **Alnus Alnobetula** (EHRH.) HART. var. **repens** (WORMSKJ.)
WINKL. (*A. viridis* var. *A. orata* var.).

Recorded from Ikertôq-Fjord 66°45' (V.), but not re-found.

A southern type known in West Greenland from 61° to 66°.

XVII. Polygonaceae.

I 121. **Oxyria digyna** (L.) HILL.

On fell-field in moist places often in the melting-water from the snow-fields. In the lowland at water-courses, in herb-mats and among stones on the talus.

Very common throughout the whole area. Widely distributed in Greenland with neither northern nor southern limit.

Abundantly flowering and fruiting.

To be sure normally covered by snow during winter.

A 122. **Rumex Acetosella** L.

In rather dry gravelly soil, on heath and in crevices. Few and scattered occurrences, but, when occurring, usually in great quantities.

Disko: Recorded from Godhavn 69°15' by HART, but during many years searched for in vain. On the other hand, European specimens of the species occur, rather commonly, as introduced weeds. This form is easily distinguished from the Greenlandic, for instance, by the decumbency: European ruderal plants in Greenland are usually decumbent, quick-growing and cannot survive hibernation.

Perhaps the specimen found by HART, belonged to this form.

The north limit of the Greenlandic form lies in the inner part of Nordost-Bugten (from a few places (V.)). Rather continuous it occurs along the coasts of Disko-Bay from Atâ 69°45' (P.) down to Sydost-Bugten; here the habitats lie close together. Westward to Egedesminde, but in the archipelago neither seen by KRUSE nor by us; in N. Stromfjord and its branchings common (P. & E.). —

From the district of Holsteinsborg recorded from Ikertôq-Fjord (V.); Maligiaq 66°58' (P. & E.).

A southern type; south of the area to be found here and there, and south of 61°30' common (ROSENVINGE).

Flowers and fruits abundantly.

Probably covered by snow during winter.

Polygonum islandicum MEISN. (*P. aviculare* L. var. *boreale* LANGE).

Occasionally observed at the settlements throughout the whole area; by us only seen at Qeqertaq 1914, about 70° (P. & E.).

Here it conveyed the impression of an introduced weed, it was flowering, but hardly fructificating before the arrival of the winter. On the

other hand it was absent here in 1918 (E. P.). This seems really to be the fact, too, in most of the other places; it may not yet be acclimated, and thus it cannot be counted among the real Greenlandic plants.

I 123. **Polygonum viviparum** L.

In all sorts of soil, in heath, herb-slopes, copses and fell-field, on sand and gravel and very often in manured soil.

Very common throughout the whole area.

Widely distributed in Greenland, with neither northern nor southern limit; ascending from the shore to considerable altitudes.

Abundantly flowering and forming bulblets in great quantities. In rich soil fruits are developed lately in good summers.

Most of the habitats are covered by snow during winter.

i 124. **Koenigia islandica** L.

Most frequently found in and by running water, in shallow places in brooks, among small stones at the borders of brooks and lakes (pools); in manured drains at inhabited places often forming extensive patches; also to be found in moist places on the heath and in moss-bogs.

Widely distributed in West Greenland without south limit; the northern limit unknown, but to be settled north of 73°.

Flowers and fructificates abundantly.

Its habitats are covered during the winter, usually by ice.

XVIII. Caryophyllaceae.

Sagina. The specimens of this genus are usually neglected by the collectors (also by us) because of their diminutiveness, and thus I have nothing of importance to add to the hitherto known facts of its distribution.

A 125. **Sagina saginoides** (L.) DALLE TORRE (*S. Linnaei* PRESL).

Disko: The south coast, Lyngmarken 69°15' (Bg.).

Mainland: N. Isortoq 67°15' (Ros.).

A southern type, the above mentioned habitats the only ones reported from our area and temporarily the north most in Greenland. No doubt rare.

Abundantly flowering and fruiting.

I 126. **Sagina intermedia** FENZL (*S. nivalis* FR. p. p.).

In sandy and clayey spots on heath and fell-field, often at the sea-shore, but also as an inland-plant, ascending the hills.

Round Disko-Bay collected and noticed by numerous collectors from many places; no doubt common. Not expressly recorded from the districts of Egedesminde and Holsteinsborg, perhaps here somewhat rarer.

Widely ranging in Greenland with neither northern nor southern limit.

Flowers and fruits abundantly.

To be sure often snowless during winter.

**i 127. *Sagina caespitosa* (J. VAIL) LANGE. (*S. nivalis* Fv. p. p.)
(*S. Pumilio* R. BR. SIMM).**

In places similar to those of the preceding one, perhaps a little dryer.

Collected and noticed by many collectors in the surroundings of Disko-Bay, to be sure rather common here. Just as *S. intermedia* not recorded expressly from the districts of Egedesminde and Holsteinsborg, but no doubt occurring here also.

Widely distributed, without south-limit; the northern limit to be searched for at Melville-Bay, north of 74°15'.

Abundantly flowering and fruiting.

No doubt often snowless during winter.

**i 128. *Honkenya peploides* (L.) EHRL. (*Halianthus*, *Ammodenia*,
Arenaria, AUTT.) var. **diffusa** HORN.**

On sandy sea-shores often forming extensive patches.

Common throughout the whole area; the distribution often interrupted owing to the absence of sandy localities.

Widely distributed in West Greenland, without southern limit. The north limit unknown, but likely to be settled near Smith's Sound.

Abundantly flowering and fruiting.

Covered by snow during winter.

V 129. *Arenaria ciliata* L. subsp. **norvegica (GUNN.) FRIES.
(cfr. OSTENFELD & DAHL: Nyt Mag. f. Nat. 55. 1917.**

On moist sand, on the hills often in melting-water from the snow-fields, in the lowland washed down by the brooks. In moist places in newly formed moraine.

Disko: Rather frequent occurrences on the northland near the coast as well as on the hills away from the sea (P.). Rare on the south coast: at Røde Elv, 69°16'; at Kūgssuaq-River near Skansen 69°20'; at Mudderbugten 69°42' (P.).

From Hare Ø and the interior of Nūgssuaq peninsula and the coasts of Waygat, rather common (P.).

Mainland: Near the inland-ice 68°45' (Engell!).

A northern type; the above-mentioned places represent the southern limit in Greenland.

Flowers and fruits abundantly.

The lowland-localities are, at any rate, covered by ice or snow during winter.

i 130. *Minuartia biflora* (L.) SCHINZ & THELL.

(*Alsine biflora* WAHL, *Arenaria sajanensis* WILLD. FERN.

In moist spots on heath, herb-mats and fell-field, on fresh moraine or among grass and other vegetation. Common throughout the whole area.

Widely distributed in West Greenland without southern limit; according to ROSENVINGE rarer in the southern part of the land probably alpine.

The north-limit unknown; to be searched for north of $74^{\circ}30'$. Ascending from the coast to the limit of vegetation.

Abundantly flowering and fruiting.

Hibernates covered by snow.

i 131. *Minuartia verna* (L.) HIERN. (incl. *Alsine rubella* WAHL.

In similar places, occurs intermingled with all sorts of vegetations. Very common throughout the whole area.

Widely ranging in Greenland with neither northern nor southern limit, from the coast ascending to the limit of vegetation.

Flowers and fructificates abundantly.

No doubt often snowless.

A 132. *Minuartia verna* (L.) var. **propinqua (RICH.) LANGE.**

(an = *Alsine hirta* WORMSKJ.)

I do not know this variety sufficiently so as to form an independent opinion of it.

The distribution is very characteristic: In West Greenland from relatively few places, all far from the outer-coast. From 60° up to Disko-Bay; the northmost places: Christianshaab $68^{\circ}45'$ (Htz.), Diskofjord: Eqvitsoq $69^{\circ}30'$ (P.), and from Mellemfjord $69^{\circ}40'$ (P.). On the east coast of Greenland: $66^{\circ}18'$ to $71^{\circ}48'$ according to KRUUSE.

By later authors, e. g. by FERNALD and OSTENFELD considered identical with the var. *hirta* WORMSKJ. which is common throughout our area.

Thus it seems to be a southern and western type in North America descending into the temperate area. (Cfr. ROBINSON & FERNALD: Gray Manual 7th edition p. 381).

V

133. *Minuartia stricta* (Sw.) HILBS.

Seems to be rare or overlooked. Only found a few times in the northern part of the area:

Disko: Qutdligssat, about 70° (Th. Fr.), Kûgaq (P.), Eqqitsaq (P.), Laksbugt (P.).

Mainland: Nûgssuaq (P.), Lierbugten about 69° (Bgl.) and Sarpiussaq 68°35' (Bgl.), this is the south limit of the species. In addition known from a few places on the north coast of Nûgssuaq peninsula near Umanaq.

A northern type, also very rare in Iceland and northern Scandinavia

Flowers and fructificates.

A

133 a. *Minuartia groenlandica* (RETZ.) OSTENE.

Recorded from Egedesminde by SØRENSEN. Afterwards searched for here and in many other places, but in vain. Within the area only once found at Holsteinborg (Mrs. DEICHMANN).

A decided southern type.

I

134. *Stellaria media* (L.) WITH.

Very common throughout the whole area, usually as a garden-weed or in manured places, favourably exposed to the sun, just in the neighbourhood of the gardens, and here it manages to exist for several years.

It is never growing far from the gardens and when these are abandoned for a series of years, it becomes undoubtedly extinct. The occurrence in the cultivated gardens is no doubt due to impurity of the garden seeds used, these being of various provenience and very variable. Some of the forms are thus annual, especially in cultures under glass-roof.

We found it indigenous, far from present and former human dwellings, at the base of the fowling cliff Naujarssuit in Qeqertalik-Fjord 66°44' (P. & E.), here growing among tall vegetation of genuine Greenlandic plants; here perennial.

A decided southern type, expressly recorded indigenous it was found by HARTZ at 61°45'.

Abundantly flowering and fruiting as well in the above-mentioned place as in the gardens.

Hibernates abundantly covered by snow.

I

135. *Stellaria humifusa* ROTTB.

At the sea-shore, as well on sand and clay as on rocks among other shore-plants; also in manured places in the neighbourhood of the shore. Sometimes forming extensive patches.

Very common throughout the whole area.

Widely distributed in Greenland without southern, and probably also without northern limit.

Flowers and fructificates abundantly.

Hibernates covered by snow and often by ice.

**I 136. *Stellaria borealis* BIG. (*St. alpestris* HARTM.
St. calycantha LEDEB.).**

In vigorous herb-slopes and copses.

Disko: Only at the hot springs on the south coast near Godhavn and in the great valleys in the inland; from many places in Diskofjord (P.), in Mellemfjord at Kuánit and Ikorfarsuut 69°44' (P.); Mudderbugt (P.).

Mainland: Recorded from Egedesminde by SØRENSEN, but in vain searched for by us both here and in a great many much more favourable places (P. & E.). Found in Ikertôq-Fjord 67°50' (Rink.; Korn.).

A decided southern type; the above-mentioned places on Disko represent the northern limit; not common till south of 61°30' (Ros.).

Abundantly flowering and fruiting.

Hibernates covered by snow, often by ice.

I 137. *Stellaria longipes* GOLDIE. (Incl. *St. Edwardsii* HOOK.)

In almost all sorts of soil, right from the sand and dunes of the sea-shore, the settlements, the manured soil of the fowling-cliffs and -islets and to the heath- and rock-vegetation, ascending to the fell-field near the inland-ice.

Often forming extensive patches and conquering places where the grass is peeled off: building sites, garden plots and the like. In the gardens it becomes a troublesome and ineradicable weed.

Very common throughout the whole area.

Widely diffused in Greenland with neither northern nor southern limit.

Abundantly flowering, but very seldom fruiting.

Only in unfavourable places not covered by snow in winter.

A 138. *Cerastium cerastioides* (L.) BRITT. (*C. trigynum* VILL.).

On moist clay- and sand-spots on the heath and very often as a pioneer on newly-formed moraine; in bogs and at the springs.

Disko: Common on the southern part of the island and in the two southmost fjords and the valleys there. Along the west coast rarer. On the Waygat-coast rare, only on the southern part.

Hare Ø (P.).

Mainland: From Waygat down the Disko-Bay-coast in spots, not as common as on Disko. Rather rare in the archipelago of Egedesminde, Qeqertarsuatsiaq 68°23' (P. & E.), not noticed by us in any locality in N. Stromfjord, but no doubt to be found on the hills in suitable places.

A southern type, the northmost habitat on Nûgssuaq peninsula $70^{\circ}40'$ (P.). South of 64° common, but especially attached to the outer land (Ros.).

From the shore ascending to at least 800 m.

Flowers lately and fructifies but scarcely.

Covered by snow during winter.

I

139. *Cerastium arvense* L.

S. Kangerdluarssuk $67^{\circ}5'$ (W. & H.) among *Salix* and *Archangelica*.

Decided southern type, found only once in Greenland.

I

140. *Cerastium alpinum* L.

As *Stellaria longipes* in all sorts of soil, and just as widely distributed as that species.

Varies infinitely as to size, the length of the internodes, pubescence, form and size of the leaves, the form and construction of tuft, the position of the shoots erect or decumbent.

No doubt most of these forms are ecological, perhaps some of them hereditable but this can only be settled by experiments in cultivation. In manured soil round the new buildings it occurs in great quantities, especially the form *procerrum* Lange, among grasses, these finally overshading and choking it.

Abundantly flowering and fruiting.

On the hills very often snowless during winter.

I have found it with expanded flowers (hibernated!!) in April (a month before it was flowering in the lowland) on the top of a Nuna-taq from the interior of Disko, ascended to 1300 m.

V

141. *Melandrium apetalum* (L.) FENZL. (incl. *f. arctica*

TH. FR. ÖFV. K. SV. VET. AK. FÖRH. 1869 p. 133).

On sand gravel, clay, bare spots on poor heath on newly formed moraine and at the borders of brooks from the inland-ice.

Disko: The northland to Nordfjord; on the eastern side to about $69^{\circ}50'$ and in the valleys common. (P.). On the south coast not seen, not even ascended. Hare O: (Nath.; P.).

Mainland: On the coast of Nûgssuaq peninsula common down to 70° , thereafter only at Eqe near the inland-ice $69^{\circ}42'$ (P.) and Claushavn $69^{\circ}5'$ (R. Br.).

A decided northern type; the above-mentioned places represent the hitherto known south limit.

Ascends the hills to the snow-line.

Abundantly flowering and fruiting.
No doubt normally hibernating snow-covered.

V 142. *Melandrium affine* J. VAHL.

On sand, gravel, clayey banks, fell-field and in bare spots on the heath, on rocks, often in manured soil.

Disko: Everywhere very common (P.).
Hare Ø (P.).

Mainland: Nūgssuaq peninsula and the land east of Disko-Bay, common. By KRUSE recorded "very rare" in the archipelago of Egedesminde; this does not agree with our observations. In N. Stromfjord common, especially on the southern side, as well as on the hills (P. & E.); likewise common in the fjords inland from Holsteinsborg (P. & E.).

A northern type, south of the area only observed a few times.
The southern limit at 65°38'.

Flowers and fruits abundantly.
Hibernating snowless, at any rate in alpine places.

V 143. *Melandrium triflorum* (R. BR.) J. VAHL.

In places similar to those of preceding one and with the same distribution, but generally rarer, but often locally better developed than *affine*. Seems to prefer manured soil to a greater extent than the preceding one, and here it becomes tall and vigorous.

In the field often very difficult to distinguish from *affine*, though always more glandular-hairy than that species. On vigorous specimens the glandular-hair can be developed to such a degree that the plants are densely covered by adhering sand and dust.

But in the seeds we have a never failing character of distinction (Cfr. LANGE and ABROMEIT).

As the preceding, a northern type and almost with the same southern limit, about 65°40'.

I 144. *Silene acaulis* L.

In almost all sorts of soil: sand, gravel, open spots in the heath and bogs, in crevices and shelves. In quick-sand it often forms spots more than one meter in diameter.

Very common throughout the whole area.
Widely distributed in Greenland with neither northern nor southern limit; from the sea-shore to the snowline.

Abundantly flowering and fruiting.
Often snowless during winter.

A

145. *Viscaria alpina* (L.) DON.

Disko: The south coast and the adjacent valleys; here and there, a great many habitats known, but not common (P.).

The north coast of Mellemfjord 69°45' rare (P.).

Mainland: Kingitsoq 70°10' (Htz.); Ritenbenk (Bgr.); Atå 68°45' (P.); at the head of Pâkitsoq-Fjord (Bgr.; P.); (not seen at Ege (P.)); Jakobshavn (W. & H.); round the Sydostbugt from several places; Egedesminde (P.); Qeqertarsuatsiaq 68°23' (P. & E.); the mainland at 68°30' (P. & E.); Kangerdluarsuk east of Agto (E. P.); common in N. Stromfjord. From the last place southward rather common, especially at some distance from the coast.

A southern type. North of the area only observed a few times, the northmost at about 72°30'.

In lime-charged soil the colour of the flower is a very intense red; a white-flowered variety has been observed at Egedesminde.

Flowers and in good seasons some of the fruits are ripened; seedlings are found.

Covered by snow during winter.

XIX. Portulacaceae.

A

146. *Montia lamprosperma* CHAM.

In moist places, for instance, periodically inundated lake-shores, moist spots between bog-mosses and heath-plants; in manured places near the houses.

The distribution insufficiently known; often overlooked because of its diminutiveness.

Disko: The south coast, from several places; no doubt common.

Mainland: From Ritenbenk down to the Sydostbugt collected from several places; no doubt common.

From the archipelago of Egedesminde recorded as "rare" by KRUSE. In N. Stromfjord at Eqaluarsuit 67°36' (P. & E.); Holsteinsborg (V.).

To be sure a southern type. The northmost localities hitherto known are in the Nordostbugt at about 70°40' (Vh.).

Abundantly flowering and fruiting.

The habitats are covered by snow and often by ice.

XX. Ranunculaceae.

A 147. *Ranunculus paucistamineus* TAUSCH. var. *eradicatus*
LAEST. GELERT (*Batrachium confervoides* FR.).

In pools and the shallow parts of lakes. Common round Disko-Bay and together with *Hippuris* the most frequent aquatic plant. There are fewer statements from the southern part of the area, but no doubt common here as well.

A southern type without southern limit in Greenland; north of the area only twice observed: $70^{\circ}28'$ (Vh.) and $70^{\circ}25'$ (P.).

Usually abundantly flowering, but during cold summers and in great lakes, in which the winter-ice does not thaw till far into the summer, the flowering may fail to take place. Fructificates when flowering.

f. *terrestris*.

In moist soil among tall *Carices*, at the border of a little lake in Blæsedalen $69^{\circ}17'$ Disko, in which the above mentioned normal Greenlandic forms occurs, a terrestrial form was observed with finely dissected leaves, sections linear, and rather rigid and considerably shorter than those of the normal form. Was just flowering Aug. 1913 (Th. P.!).

I 148. *Ranunculus divaricatus* SCHRANK. New to Greenland! (Conf. GELERT: Bot. Tidsskr. 19 p. 27 f. *pygmaea*).

A rather deviating form was observed in a pond in the great valley from the head of Nordfjorden about $69^{\circ}55'$. The stalks and submerged leaves deep reddish brown, not fresh green-coloured as in the preceding.

With numerous floating leaves, varying from 3—4 lobed with lobed sections, gradually to pluridivided with linear sections. The underside subpubescent. Submerging leaves capillary, not or only slightly collapsing when withdrawn from the water.

With some hesitation I have classified this plant under the name given above, as the form of the leaves sheaths and the floral parts refer it to *R. divaricatus*, the flowers were somewhat larger and more showy than in the preceding. This variety was heretofore not recorded from Greenland neither from any arctic country.

The plant was growing very vigorously. In some parts of the pond the surface of the water was quite covered by the floating-leaves and fair white flowers (Th. P. & P.).

Both species hibernate under and enclosed in ice.

T 149. *Ranunculus affinis* R. BR. SIMMONS: Ellesm. p. 101.

Only once observed within the limits of the area at Arssalik, $67^{\circ}30'$ (KORN.). Another time collected in S. Stromfjord a little south of our area (Jens.). These occurrences are quite isolated and outside the extension of the species.

High-arctic type, otherwise known from North- and East Greenland.

I 150. *Ranunculus acer* L.

In herb-mats and copses.

Præstefjældet at Holsteinborg $66^{\circ}55'$ (W. & H.).

A decided southern type with northern limit here.

Besides known from Godthaabs-Fjord and common in the south-most part of Greenland (ROS.).

Flowers and fructificates.

Hibernates covered by snow.

I 151. **Ranunculus pygmaeus** WAHL ENBG.

In moist moss, among pebbles at the borders of brooks, in the melting-water from the snow-fields, in moist places on the heath; very often in outlets from manured places near the settlements.

Very common throughout the whole area, though in the fjords of the southern part generally ascended. In the northern part ascending to the limit of vegetation.

Widely distributed in Greenland without north-limit, on the west coast continually down to about 64°; south hereof known only from a few, generally high-alpine, habitats.

Abundantly flowering and fruiting.

Hibernates covered by snow and often by ice.

V 152. **Ranunculus nivalis** L.

In moss-bogs, moist spots in the heath and moraine, in fell-field.

Disko: Very common on the northland; rather common on the southland and in the fjords (P.).

Hare O, common (P.).

Mainland: Common on Nûgssuaq peninsula and the land east of Disko-Bay. Very scarce in the district of Egedesminde, as well in the archipelago as on the land beyond. N. Stromfjord about 68° (KORN. Not seen by us); Holsteinsborg 66°50' (W. & H.).

A northern type, the last mentioned places represent the southern limit.

From the coast ascending to the snow-fields and the inland-ice.

Flowers and fructificates abundantly.

Hibernates covered by snow.

V 153. **Ranunculus sulphurus** SOL. (*R. altaicus* LAXM.).

In places similar to those of the preceding one and almost with the same distribution in the area, but somewhat rarer.

Disko: Rather common on the northland and ascended; on the south coast till 69°15' rarer, but known from many places right down to the sea-shore (P.).

Hare O (P.).

Mainland: Common within the basaltic part of Nûgssuaq peninsula; hitherto not observed south of Torssukâtak about 70°, neither by previous collectors nor by us; but no doubt it may be found here. Recorded by SØRENSEN from Hunde

Ejland and Manermiut 68°35'; in vain searched for in these places by KRÜGER and us.

A northern type, the above-mentioned places represent the southern limit.

Abundantly flowering and fruiting.

Hibernates covered by snow.

I 154. **Ranunculus hyperboreus** ROTTB.

In moist places, for instance, in moss at the springs, in small pools, often in manured soil.

f. **fluitans!** (Syn. *R. aquatilis* var. *arcticus* Durand Pl. Kan. No. 1. Appendix to E. K. KANE: Arctic Explorations The Second Grinnell Exp. in search of Sir John Franklin 1853, 54 55', Philadelphia 1856 vol. II).

In small sheltered and manured pools at the settlements a luxuriant form occurs with lengthened petioles, and floating leaves of extraordinary size. Most frequently the whole surface is covered by them. —

Most frequently quite sterile, but sometimes flowering at the margins of the patches as the water gradually dries up.

I do not doubt of the identity of the plant collected by KANE and determined by DURAND, with the above mentioned variety, though the flowers are recorded white. The petals of various *Ranunculus*-species, especially those of *R. hyperboreus* and *nivalis*, often become white during the drying, especially when the specimens are laid in the press in wet condition.

Disko: Very common, from the coast ascending to considerable altitudes.
Hare Ø (P.).

Mainland: Nügssuaq peninsula and the land east of Disko-Bay, common. Rather common in the archipelago of Egedesminde; scarce, alpine or absent in the fjords. Thus we found it common at Taseralik at the mouth of N. Stromfjord, but absent in the inner part, not even ascended. Also known from several places near Holsteinsborg.

Widely distributed in Greenland, without northern limit.

Also known right down to southmost Greenland, but scarce and seems here limited to the outer islets (Ros.).

With the exception of the water-form commonly flowering and fruiting.

Hibernates covered by snow and often by ice.

A 155. **Ranunculus lapponicus** L.

In moist moss-bogs in the lowland favourably exposed to the sun during the summer.

Common throughout the whole area though often absent or locally scarce, for instance, the coast-region of N. W. Disko, but occurring in great quantities in the great valleys at the head of Nordfjord. North of the area common inland from the outer-coast at least to the fjords at 72° 32'; here it occurs in such quantities that the north limit must lie farther northwards (P.). South of the area still common in the fjords inland from Holsteinsborg (P. & E.). But south hereof only once observed at 65°, and a few times in the southern part of the Godthaabs-Fjord at about 64° 8'.

Not known from East Greenland (nor from Iceland)!

(Compare with this its interesting distribution in Fennoscandinavia: A. HEINTZE Bot. Not. 1914, p. 181 ff.).

Flowers late in the summer and is usually setting fruit even at the northmost habitats. The fruit-stalks project above the first snow-cover.

All the stalks and roots are deeply buried in moss, only the leaves and flowers projecting above the surface.

Abundantly covered by snow during winter.

A

156. *Ranunculus reptans* L.

In shallow pools; in the creeks of lakes, here often among *Carices*.

Throughout the whole area rare or overlooked.

Disko: South coast near Godhavn, 69°15', several localities (Th. P., E. P.)
Mudderbugt, 69°35' (P.).

Mainland: Marraq north of Nüssaq 70°30' (P.), Atanikerdluk 70°5' (Nath.);
Naujat about 70° (Htz.); Pákitsoq Fjord (Bg.; P.); Jakobshavn (Sør.); Claus-
havn (Bg.); Orpigssuit (Htz.); Tasiussarssuaq (Bg.; Bl.); not recorded from Egedes-
minde nor from Holsteinsborg, but no doubt overlooked.

A southern type. North of the area only found on Qaratsap
Nunata 70°30' (Vh.).

All the mentioned places in the lowland.

Sparingly flowering, but fructificates though not every year nor
in all places.

A

157. *Thalictrum alpinum* L.

In herb-mats and copses.

Disko: Rather common on the south coast and in the adjacent valleys. Diskofjord: rather common on the north side, on the southern side only at the hot springs. Mellemfjord: on the north side, but rare (P.).

Hare Ø: on the south-coast (P.).

Mainland: Nùgssuaq 70°40' (P.); Ritenbenk and the surroundings hereof 69°40' (several collectors); Jakobshavn (Bg.); from the Sydost-Bugt and south-
wards rather common at some distance from the coast (P. & E.). Common south
of 64° (Ros.).

A southern type; only found once north of the area on Úmánáq
Storø 70°40' (Vh.).

Within the area only a lowland plant.
Abundantly flowering and fruiting.
Hibernates abundantly covered by snow.

1 158. **Anemone Richardsonii** HOOK.

In copsis.

(Disko: On the printed labels of J. VAHL recorded from 69°14', the latitude of Godhavn. The specimen does not exist and now the plant is absent here. The record may be due to a slip of memory on the part of VAHL, but it is also possible that the plant has locally become extinct afterwards. The locality Lyngmarken, from which the most of the rare plants originate, has suffered very much from willow-felling and thus many southern plants have undoubtedly been eradicated.)

Mainland: S. Kangerduarssuk 67°5' (Jens.); from various places near Holsteinsborg 66°55' (several collectors); Naujarssuit in Qeqertalik Fjord 66°45' (P. & E.).

A decided southern type; with the exception of the Holsteinsborg district only known from a few places in S. Isortoq 65°20'—40'.

Abundantly flowering and fruiting.
Hibernates abundantly covered by snow.

1 159. **Coptis trifolia** SALISB.

In herb-mats, willow-copses and vigorous heath.

Very rare, only in the southmost part of the area. S. Kangerduarssuk (W. & H.); N. Isortoq (Ros.); N. Stromfjord at 67°32' (Sor.); Kangerduarssuk east of Agto 67°58' (E. P.).

A decided southern type; the last mentioned place represents the north limit. According to ROSENVINGE common south of 64°. All the northern localities are in the lowland.

Our specimens were sterile, and I have also got sterile specimens from Godthaabs-Fjord, probably it only flowers during favourable summers at its north limit.

Hibernates under a thick layer of snow.

XXI. Papaveraceae.

! 160. **Papaver radicatum** ROTTB.

In barren gravelly places, new moraine and fell-field, in dried-up river-beds and deltas; less common on open heath or among grass and other plants in manured soil. Common throughout the whole area, in the northern part from the coast to the snow-line, in the southern part preferably in the highland.

Widely distributed in West-Greenland, rather a northern type, on the west coast becoming scarce south of 64°, and on the east coast it seems to be very rare south of 69°.

Note: *P. radicum* no doubt includes several small species as already indicated by SIMMONS and others. The white-flowered variety is common far into the north, but very rare, already in our area. On account of its occurrence in patches and for other reasons, too, it seems to be hereditary constant.

Flowers and fruits abundantly. Many fruits are devoured before ripening by birds, for instance ptarmigans and snow-buntings.

Hibernates often snowless.

XXII. Cruciferae.

I 161. *Cardamine bellidifolia* L. (*C. sinuata* (Vahl) ROWLEY & WIEGAND).

On moist sand and clay, in fell-field and new moraine; bare spots on the heath, rarer among grasses in manured soil.

Throughout the whole area from the coast to the snow-line, but from relatively few places; undoubtedly not because of being rare, but only overlooked.

Widely distributed in Greenland although rather a northern type; in the southmost part of Greenland only exceptionally from the lowland (Ros.).

Abundantly flowering and fruiting.

Undoubtedly covered by snow during the winter.

I 162. *Cardamine pratensis* L. var. *angustifolia* Hook.

In moist moss-bogs, at the borders of small lakes often partly submerge; sometimes in shallow brooks.

Distributed through the whole area, most frequent in the southern part, but nowhere common. Now and then occurring in small patches.

Widely ranging in Greenland without southern limit; and no doubt without northern limit, too, being found far north into Ellesmereland. The scattered occurrence is no doubt due to the fact that the plant does not fruit anywhere in Greenland, but disperses itself only in vegetative manner, by deciduous leaflets.

Usually flowering, though hardly in unfavourable places.

The flowering is specially dependent on the time of the melting of the snow.

Normally the flower is pure white. On limecharged soil it becomes lilac, almost as the European form.

Hibernates covered by snow and often by ice.

A 163. *Arabis alpina* L. (Incl. *A. glabra* A. Bl. ROWLEE & WIEGAND).

From the herb-mats, copses, springs, water-courses and moss-bogs of the lowland ascending to the fell-field and moist edges of moraines. Very common throughout the whole area.

A southern type; the known north limit now lying at about $72^{\circ}30'$. Nevertheless in South Greenland more frequent in the coast region than in the fertile part of the interior.

Abundantly flowering and fruiting.

Hibernates covered by snow.

A 164. *Arabis Holboelli* HORN. (*Turritis retrofracta* (HOOK.).

On sunny, not too dry slopes.

Disko: The south coast near Godhavn $69^{\circ}15'$ from several places (several collectors, for instance, HOLBOLL); Mellemfjord $69^{\circ}42'$ (Th. Fr.).

Mainland: Tasiussarssuaq (Bg.; Bl.); Christianshaab (Sor.); Jakobshavn (Holboll); Sarqaq about 70° (V.). Common in the region of Holsteinsborg; especially in the Fjords.

South of the area rather common till 64° , but south of this latitude only a single specimen is known from about 61° (Ros.).

In spite of this it must be stated as a decided southern type according to its occurrence in America.

Abundantly flowering and fruiting.

Certainly always covered by snow during winter.

I 165. *Arabis Hookeri* LANGE (*Turritis mollis* HOOK.).

In favourably situated and rather moist places. Rare and local.

Disko: Without locality recorded by VÆL; not re-found.

Mainland: Ege $69^{\circ}42'$ near the glacier (P.); N. Stromfjord: Amitsuarssuk (Korn.?) Sánerut (Korn.); N. Isortoq (V.); the fjords inland from Holsteinsborg: numerous places (several collectors).

A northern type; south of the area only observed in a few places, the southmost at about 64° . North of the area extraordinary many localities in the southmost part of Nordost-Bugt. Besides known from the district of Cape York.

Abundantly flowering and fruiting

I 166. *Arabis arenicula* (Rich.) Gil. (*Sisymbrium humifusum* J. VAHL. *Parryae* sp., *Eutremae* sp. AUTR.).

On new moraine, gravelly and sandy fell-field and most commonly found in river-deltas, washed down from the hills.

Disko: The northland; the coast and the great valleys; from Quttligssat to Nordfjord, being rather common here (P.); N. Læsbygut on the west coast and Kuánerssuit in Diskofjord (Th. Fr.).

Mainland: The great valley and the Waygat-coast of Nügsuaq peninsula rather common (P.); south hereof rare; Ege 69°42' near the glacier (P.); Pákitsoq about 69°30' (V.).

A northern type; south of the mentioned places only seen a few times either alpine or washed down from the highland, but found right down to the south point of the land.

Abundantly flowering and fruiting.

To be sure often snowless during winter.

I 167. *Nasturtium palustre* (L.) R. Br.

Found once at the river of S. Stromfjord, about 67° (Jens.) and once at about 61°.

A decided southern type.

I 168. *Braya humilis* (C. A. MEY.) ROBINSON (*Sisymbrium h.* C. A. MEY.).

On lime-charged soil and raised marine clay.

From a few places at the head of S. Stromfjord (Jens.), Portage between Itiv-dleq and S. Stromfjord about 66°30' (P. & E.), here in great quantities and locally the most characteristic plant. Here decidedly perennial and not hapaxanthic as recorded by LEDEROVR. Cfr. LANGE Conspl. II, p. 252).

A southern type, in Greenland only known from the mentioned places, but in America to be found right down into the temperate area.

Flowers and fruits abundantly.

Undoubtedly hibernating under snow.

V 169. *Braya purpurascens* (R. Br.) BUNGE; *Platypetalum* R. Br.

On new moraine, sandy and gravelly fell-field, from here often washed down and to be found in the river-deltas. Often growing in company with *Arabis arenicula*.

Disko: The north-east coast from Asuk to Kùgánguaq (Th. Fr.; P.), and from the valleys beyond the coast (P.). Diskofjord: at the great glacier north of the inmost branch at Kuánerssuit about 69°40' (P.).

Mainland: The great valley of Nügsuaq peninsula, rather common (P.); the Waygat-coast from several places (several collectors); Ritenbenk, 69°42' (V.).

A decided northern type; the-above-mentioned localities represent the south-limit of the species.

Abundantly flowering and fruiting.

No doubt often snowless during winter.

I 170. *Cochlearia officinalis* L.

In Bih. t. K. S. Vet. Ak. Handl. Bd. 26, Afld. III, No. 1, p. 34 G. ANDERSSON and H. HESSELMAN have published a few short diagnoses and figures by the late O. GELERT of the forms of *Cochlearia* as far as they were known at his time from arctic regions. Hence it is usually easy to refer a specimen to one of the three forms acknowledged by GELERT:

β. *groenlandica* (L.) Gel.

γ. *oblongifolia* (D. C.) Gel.

δ. *arctica* (Schlecht.) Gel.

But as GELERT did not succeed in completing the revision before his death, and as he unfortunately did not leave any list of synonyms of the forms known from Greenland, a satisfactory distribution cannot yet be given.

Cochlearia officinalis is growing near the shore, often among other plants and in manured soil.

Very common throughout the whole area.

Abundantly flowering and fruiting.

Hibernates covered by snow and ice-foot.

A 171. *Draba incana* L.

In herb-mats.

Disko: Only observed once at Narssaq at Waygat 69°50' (P.).

Mainland: From the vicinity of Disko-Bay, very rare: Sarqaq about 70° (V.); Tasiussarssuaq (Bg.; Bl.) and southwards perhaps less rare; nevertheless we did not find it in the fjords of the Egedesminde district. In the southmost part of Greenland very common (ROSENVINGE).

A decided southern type, the mentioned places represent the north limit in Greenland.

Recorded from about 79° by WETHERILL, but I should consider this a confusion with *Dr. arctica* (Cfr. PORSILD: Medd. om Grld. 47, p. 244).

Within the area a lowland plant.

In the flora the plant is usually given as biennial; but in "Flora v. Deutschland und Fennoskandinavien sowie von Island und Spitzbergen" F. HERMANN very correctly remarks that new rosettes often

appear in the axils of the old rosettes, the plant in this way being perennial.

This is the case with the plant from Greenland (Julianeabab, Qaqortoq leg. C. Petersen; Arsuk leg. Lindhard; Qeqertalik at Holsteinborg leg. Porsild), but I have also seen it on specimens from the Alps with inflorescences from the preceding year (Searl, leg. BRAUN-BLANQUET) and from Scandinavia (Visby, leg. K. JOHANSSON).

Other specimens from Greenland and elsewhere do not flower till after a strengthening of several years. Specimens flowering in the second year I have seen from the southmost part of Greenland (Pamiagdluk, leg. E. Lundholm) and this was also the case with plants cultivated here on Disko from seeds brought from Rigi-Scheidegg in the Alps. (Cfr. also ELISABETH ERMAN, Arkiv f. Bot. 12, No. 7, p. 15).

To be sure covered by snow during the winter.

A

172. *Draba aurea* M. Vahl.

On spots favourably exposed to the sun, sandy and gravelly slopes.

Disko: Very rare; Diskofjord: Ikineq $69^{\circ}25'$ (P.) and Kuánerssuit $69^{\circ}35'$ (P.).

Mainland: Rare at Disko-Bay: Sarqaq about 70° (V.); Jakobshavn (V.); in surroundings of Sydost-Bugten several places, Sofiehavn (Bl.); Simiutarsuaq in the district of Egedesminde (K.); N. Stromfjord, several places (P. & E.), for instance, at the tenting-place Ugssuit it was characteristic of clayey-gravelly slopes. Becoming more frequent southwards; common in the fjords inland from Holsteinborg (P. & E.).

A southern type, the mentioned places represent the north-limit

Abundantly flowering, the seeds are often only partially developed.

Hibernates covered by snow.

V

173. *Draba alpina* L.

On new moraine, in open spots on heath and generally to be found in waste tracts.

Disko: The northland especially along Waygat, rather common (P.); in the southland rare, most frequently washed or blown down from the hills.

Diskofjord: Kuánerssuit $69^{\circ}35'$ (P.); Maligiaq (Sor.); from several places near Godhavn (P.).

Hare O (Nath.; P.).

Mainland. Rather common from the coast and interior of Núgssuaq peninsula (P.); from several places near Torssukátak. South of the ice-fjord of Jakobshavn very rare: Lerbugten about 69° (Bg.); Akúnàq about $68^{\circ}40'$ (Sor.); Simiutarsuaq about $68^{\circ}10'$ (K.).

A northern type, the above mentioned places represent the south limit of its continual distribution. Quite isolated it has been found on Jensen's Nunataq $62^{\circ}50'$ at an altitude of 1250 m.

Around Disko-Bay also to be found in the lowland.

Abundantly flowering and fruiting.

Undoubtedly snowless now and then during the winter.

I 174. **Draba crassifolia** GRAH.

This insignificant species is undoubtedly often overlooked, thus the distribution insufficiently known.

Disko: At Godhavn in the lowland as well as on the hills; observed several times.

Hare O (P.).

Mainland: Sarqaq (V.); Kangâtsiaq (Sor.); Ikertôq Fjord ca. 66°45' (V.).

South of the area found at 64°40', north of it till ca. 73°. From East Greenland also known from places on the middle of the coast. Nevertheless I am inclined to consider it a northern type, and it is no doubt to be found far northwards.

LANGE Conspectus p. 38 writes: "annual or biennial hardly perennial". Specimens from Godhavn are plainly perennial.

In sound condition the petals are pale yellow; I have never seen white flowers (Cfr. E. Ekman I. c. p. 13).

Flowers and fructificates.

No doubt normally covered by snow during the winter.

I 175. **Draba nivalis** LILJEBL.

On rocks, rarer on gravel. Very common throughout the whole area.

Widely ranging in Greenland without northern or southern limit. From the shore to the snowline.

Abundantly flowering and fruiting.

Hibernates, often snowless.

V 176. **Draba fladnizensis** WULF (Incl. *Dr. lapponica* WAHL,
Dr. Wahlenbergii HARTM.).

In all sorts of soil: sand, clay, gravel, rocks, among grasses a. s. o. Very common throughout the whole area.

Widely ranging in West Greenland, but a northern type without north limit, but with a southern limit of continual distribution at about 64°; south hereof only observed once.

Ascends the hills to the snowline.

Abundantly flowering and fruiting.

Often snowless during winter.

T

177. **Draba subcapitata** SIMM.

This very small species of the high north has not been known with certainty till after the investigation by SIMMONS (Ellesmereland, p. 87 ff.); it has been found a few times at the north limit of the area.

Disko: The north-east coast a little north of Kūgānguaq $70^{\circ}10'$ (P.).

Mainland: From the mouth of the great river of Nūgssuaq and southward several places $70^{\circ}20'$ - $25'$ (P.); in these places growing on very barren rocks of trap-breccie.

The mentioned places represent the southern limit of the species in Greenland.

Flowers and fruits abundantly.

No doubt snowless during winter.

!

178. **Draba hirta** L. (Incl. *Dr. rupestris* R. BR.).

In all sorts of soil from the most barren fell-field and rocks to vigorous heath, herb-mats, copses and grass-fields of the lowland; often in manured soil.

Very common throughout the whole area.

Widely ranging in West Greenland, but particularly a northern type. The continuous distribution stops at about 64° according to ROSENVINGE; south hereof very rare, no doubt alpine.

Varies very much, most of the varieties being of ecological nature.

Very abundantly flowering and fruiting.

Often snowless during winter.

V

179. **Draba arctica** J. VAHL (? *Dr. magellanica* LAM. EKMAN).

Nomenclature of some North-European Drabae. Ark. f. Bot. 12.
No. 7 1912 p. 2).

In places similar to those of the preceding species.

Disko: Hare Ø and the Mainland down to the ice-fjord of Jakobshavn, common but not in the same degree as the foregoing. South of the ice-fjord rather scarce; at $68^{\circ}30'$ (P. & E.); Kangerdluarssuk at Agto $67^{\circ}55'$ (E. P.); N. Stromfjord, Ungóriarfik (Korn.), not seen by us anywhere in the fjord; From the neighbourhood of Holsteinsborg and the adjacent fjords recorded by many collectors.

A northern type, having its southern limit of continual distribution in West Greenland at ca. 67° , but occurs isolated at $64^{\circ}10'$.

I cannot accept the opinion expressed by SIMMONS and other authors, that *Dr. arctica* is to be considered a variety of *Dr. hirta*. I willingly admit the difficulty of referring certain specimens to one of the species, but judging by their occurrence in nature I have the decided impression that they are different; and the most important mark: the pubescence is hereditably constant.

Abundantly flowering and fruiting.
Often snowless during winter.

V 180. *Lesquerella arctica* (WORMSKJ.) WATSON.

On sand, especially in the domain of the carboniferous formations, on gravel, dry moraine and river-deltas.

Disko: Coast of Waygat down to $69^{\circ}50'$ and Kùgánguaq-valley, common (P.).

Mainland: Nùgssuaq peninsula: the coast of Waygat and the interior part of the great valley, common (P.); south of Torsukátak only found a few times: north of Ritenbenk (Sylow); Svarte Vogelbay (Htz.); Eqe $69^{\circ}42'$ (P.); Lerbugten about 69° (Bg.).

A decided northern type; the mentioned places represent the south limit in West Greenland.

Abundantly flowering and fruiting.

Perhaps snowless now and then during winter.

XXIII. Crassulaceae.

A 181. *Rhodiola rosea* L.

On sunny rocks especially near the shore, on sand and gravel; also to be found inland far from the sea.

It is very difficult to account for the distribution of this species here at the north limit because of some records, which seem to have appeared through a slip of the memory or changing of labels. An old record by KANE exist from Upernivik; the species has not been re-found here, but as KANE's plant-lists contain many mistakes, evidently owing to confusion of material from North- and South Greenland, we need not pay any attention to this record. Later on TH. HOLM records the plant from Proven $72^{\circ}23'$, Skarvefjæld and Asungasungâq near Godhavn. None of these specimens exist in H. H., and in vain I have searched for the plant in all the places through many years. —

As a matter of fact the natives do not know the plant from Godhavn, and as *Rhodiola* is a highly valued article of food it certainly belongs to the plants known by the natives.

On the mainland common from Holsteinsborg to the southern part of the district of Egedesminde.

KRUUSE states the northern limit here at Kangâtsiaq $68^{\circ}11'$; we have only seen it south of this place (P. & E.). Isolated found at Akugdlit $69^{\circ}43'$ (Engell) and at Jakobshavn $69^{\circ}13'$ (Sor.) (in vain searched for, P.); from several places in Sydostbugten and from Nùk at Christiansaab $68^{\circ}50'$ recorded by the natives.

A southern type.

Flowers and fruits abundantly.

Hibernates undoubtedly covered by snow.

A

182. *Sedum villosum* L.

On warm, not too dry rocky slopes, favourably exposed to the sun.

Disko: From several places near Godhavn (several coll.) Diskofjord; Kuånessuit 69°35' (P.); no doubt often overlooked on the south-land.

Mainland: Rather common in the domain of Holsteinsborg and the inner parts of the land north hereof to Sydostbugten. North of the ice-fjord of Jakobshavn known from Jakobshavn 69°13' and Pákitsoq 69°30' (V.; P.).

A southern type, north of the area only once found at Qarajaq 70°30' (Vh.).

Abundantly flowering and fruiting; besides abundantly vegetative propagation.

Hibernates under a thick cover of snow and often of spring-ice.

XXIV. *Saxifragaceae*.

I

183. *Saxifraga oppositifolia* L.

On highland-moraines down to the shore, occurring as well in barren places: gravel and open clayey flats, as among other plants when not overshadowed by these. Thus it often grows among grasses, and in this case it flowers before the grass begins to sprout.

Very common throughout the whole area.

Widely ranging in Greenland without southern or northern limit: in the southern part, however, less prominent and usually alpine.

Flowers and fructificates abundantly.

Often snowless during winter.

Not much variable. The forms *pulvinata* and *reptans* described by ANDERSSON and HESSELMANN (Bih. K. S. Vet. Ak. Handl. B. 26, Afld. III, Nr. 1, 1900, p. 25, fig. 10—12) are very common. The last, as remarked by the authors, usually in places inundated during the spring-time. Also very commonly found on gravelly banks of brooks.

A

184. *Saxifraga Aizoon* (L.) JACQ.

On sunny rocks and slopes, open spots in the heath and among grasses.

Disko: Rather common on the south-land and in the fjords, not observed on the north- and Waygat coast (P.).

Mainland: From the inner gneiss-domain north of Torssukátak and down to the Jakobshavn icefjord in several places, though not common. South of the ice-

fjord rather common. In the inner part of Egedesminde district rather common; occurs but sparingly in the archipelago. In N. Stromfjord and the surroundings of Holsteinsborg common (P. & E.).

Widely distributed in West Greenland (more scarce in East Greenland), without southern limit; the northern limit not yet known, but to be searched north of $74^{\circ}30'$. Only few habitats known to the north of the area.

In the northern part of the area mainly in the lowland and only ascending some two hundred meters.

Abundantly flowering and ordinarily also fruiting.

Without doubt sometimes snowless during the winter.

Not much varying; the forms *v. brerifolia* Engl. and *β. robusta* Engl., are only ecological.

I 185. **Saxifraga aizoides** L.

On spots with longlasting snow, amongst mosses, sometimes on clay and fresh morainic soil.

Disko: Rare, only collected in a few places on the north-land and here particularly away from the coast (P.).

Mainland: In the great valley and at Atâ on the west coast of Nûgssuaq peninsula, and a few places south of Atâ; but scarce (P.). Between Torsukâtak and the Sydostbugt from several places; Eqe (P.); Atâ (A. P. Olsen!); Pâkitsoq (V.); Hordleq (Bg.; P.); Jakobshavn (V.); Nunatap tasia (Engell!); Lerbugt (Htz.). Also south of Disko Bay scarce: Egedesminde O (Lundager!); Alângorssuaq at Iginiarfik (K.); N. Stromfjord, Eqaluarssuit (P. & E.). In the district of Holsteinsborg known from the colony itself (Holb.) and Qeqertalik (Brummerstedt).

Widely ranging in Greenland without southern limit; northwards at least to 78° . Always scarce when occurring.

In most of the places not flowering till late in the summer, hence the fructification usually fails. When sterile, very easily overlooked because of its diminutiveness and occurrence in mosses.

Hibernates covered by snow.

I 186. **Saxifraga groenlandica** L. (*S. decipiens* EHRL.).

In every kind of soil, dry as well as moist, on rocks and in friable soil, in deserted places and among other plants, now and then in manured soil. Very common throughout the whole area.

Widely distributed in Greenland without northern or southern limit. Ascending to the limit of vegetation.

Flowers and fructificates abundantly.

Often snowless during winter. Varying very much, most of the varieties described seem to be mere ecological forms.

I

187. *Saxifraga nivalis* L.

In bogs, herb-mats, on rocks and fell-field; best developed in sunny crevices with abundant moisture.

Common throughout the whole area, but nowhere occurring in great quantities.

Widely ranging in Greenland without northern or southern limit. Ascends to considerable altitudes.

Abundantly flowering and fruiting.

Hardly snowless during winter.

Varies according to the quality of the habitat from the smallest dwarf-forms to robust gigantic specimens.

A

188. *Saxifraga stellaris* L.

To this species I only reckon the so-called mainspecies: *S. stellaris* a characterized by richly ramified inflorescences, abundant flowering and fructification, large rosette-leaves and low stems, whilst the following species has a rich development of bulblets in the inflorescence, narrower and firmer leaves and higher stems. In 1910 I collected plants of *S. stellaris* near Godthaab (64°11') and cultivated them on South Disko where this species does not occur. They flower and fructificate every year and keep the normal aspect of the vegetative parts, without forming any transitions to *S. comosa*.

LINSBAUER (Oesterr. Bot. Zeit. 63, 1913; not seen, abstract in Bot. Centralbl. 126, p. 313) has cultivated bulblets of *S. comosa* and developed flowering specimens. From the abstract it cannot be seen whether they also were *S. comosa*, what I suppose, as flowering, in my opinion, does not mark a transition to *S. stellaris*. Young and feeble specimens of *S. comosa* will often show one or a few flowers without any bulblets at all, whilst older and more vigorous specimens develop bulblets abundantly, with or without development of flowers.

S. stellaris seems to be absent in America, whilst *S. comosa* is widely distributed in Arctic America.

LINDMARK (Bidrag till kännedomen om de svenska Saxifragarter ytterligare beskrivning och individbildning. Bih. K. Sc. Vet. Ak. Handl. 28, Afd. III, Nr. 2, 1902) figures, in pl. II figs. 4 and 5, seeds from specimens from northern Sweden and states their size to be 0,6 mm. In the figure the seed-coat is covered by rather long and coarse seriated papillae (»seriatim tuberculata« LANGE). Seeds from dried specimens from Valders, Norway, showed the same appearance. The seeds of *S. comosa* from Greenland were somewhat larger, 0,7—0,8 mm, the papillae were lower, their rows denser, their appearance intended to be

granulated rather than tuberculated. - For this investigation I had, however, only a scanty material at my disposal.

S. stellaris grows in luxuriant herb-mats and moss bogs and is common in Southern Greenland up to 65° (Ros.). In our area it is recorded from Manitsooq, 68°45' and Ilkamiut, 68°30' by BERLIN. I have not seen the specimens, and therefore I cannot ascertain, whether they merely were flowering individuals of the subsequent species or not. We have searched for *S. stellaris* in the southernmost part of our area, but mostly in vain; only once, at Ivnalik in N. Stromfjord, 67°30', did we find specimens of the true *S. stellaris*, not yet flowering Aug. 6, 1918.

A distinct southern type, the above mentioned places are the northern limit in West Greenland.

V 189. **Saxifraga comosa** (RETZ.) BRITTON (*Spathularia foliolosa* (R. Br.) SMALL).

In moist moss on bogs and heathland sometimes in manured soil and in moist places in alpine situations.

Very common throughout the whole area, but less prominent and preferably alpine in the southern part. Hence considered a northern type.

Widely distributed in West Greenland without northern limit, decreasing southwards though found right to 62°. Not known from the southern part of the east coast, where *S. stellaris*, according to KRUUSE, occurs at least to 67°.

In favourably exposed places flowering and also fruiting (see remarks to the preceding species); besides producing bulblets in abundance. In unfavourable places the flowers fail to appear at all.

Hibernates covered by snow.

I 190. **Saxifraga rivularis** L.

In wet places, moist moss, at the borders of brooks and lakes and often in manured soil; from the brackish lagoons at the shore ascending to the melting edges of the snow-fields.

Very common throughout the whole area.

Widely distributed in Greenland without southern or northern limit.

Hibernates covered by snow and very often by ice.

Varies very much according to the quality of the habitat. Most of the forms are coloured red by anthocyanine; but among the various forms there is one with green leaves and white flowers almost without anthocyanine-formation. The occurrence of this form does not seem to be dependent upon the habitat, judging by the wanting transition-forms when growing among the red forms; and apparently it seems to be hereditary constant. (Comp. PORSILD: Medd. om Grld. 50, p. 377).

I

191. *Saxifraga cernua* L.

In not too dry soil, in bogs, heath, herb-mats and copses, very often in manured soil, rarely in fell-fields.

Very common throughout the whole area.

Widely distributed in Greenland without northern or southern limit, though more scarce on the southern part of the West coast being here defeated in the competition with dense vegetation (Ros.).

From the shore ascending to the snow-fields.

In luxuriant habitats flowering abundantly. Ripe fruits were never described, only LINDBMARK records unripe capsules filled with ovules. A very productive dispersal is effected by means of the small dark-red bulblets on the stem.

As a rule covered by snow in winter.

V

192. *Saxifraga tricuspidata* ROTTB.

On rocks and coarse gravel, sometimes in dry heath or fell-field.

Very common throughout the whole area.

A northern type, in West Greenland common to ca. 64° without northern limit. Ascends from the shore to the limit of snowless land, occurring even on the Nunataq's above widely extended snow-fields.

Abundantly flowering and fruiting except in extremely unfavourable places. I have never seen yellow tints in the corolla, only white ones with orange-coloured spots.

Usually snowless during winter. Not much varying; in the shade, for instance in crevices, lengthened green forms occur, the plant, as a rule having an intense red colour; they are usually sterile. Often forming extensive patches.

XXV. Rosaceae.

A

193. *Sibbaldia procumbens* L.

In herb-mats and on the edge of willow-copses.

Disko: Very common on the south coast and in the valleys here and in Diskofjord; rather common on the northern side of Mellemfjord. Here and there on the west coast and in the valleys here up to ca. 70°10' (P.); not observed in the great valleys of the Nordfjord nor at the hot springs on the Waygat-coast.

Mainland: In the southern part of the area in the district of Holsteinsborg rather common; also found northwards, but not continuously. Thus it is common along the coast and rather common in the southern part of the archipelago of Egedesminde (with exception of the small barren outside-islets). On the contrary, rare in N. Stromfjord, where it is has been recorded by KORNERUP; found by us in a single place: on the north coast opposite Eqaluarsuit. In the surroundings of the Sydostbugt and along the east coast of Disko-Bay up to Torssukatak, rather common, but decreasing in frequency northwards. North of Torssukatak only known from Sarqaq (V.); Majorqarssuatsiaq (Bg.); Hare O (P.); and the settlement Nûgssuaq (P.).

A southern type; north of our area only once found at the south coast of Svartenhuk at ca. $71^{\circ}42'$ (P.), the northern limit in West Greenland.

Abundantly flowering and fruiting.

Hibernates covered by snow.

I 194. *Potentilla (Comarum) palustris* (L.) Scop.

In small, shallow pools.

A decided southern type, only observed a few times in the southmost part of the area: Praestefjæld at Holsteinsborg $66^{\circ}55'$ (W. & H.; P. & E.); Sarfarsuaq $67^{\circ}50'$ (P. & E.).

At the beginning of August our specimens from Holsteinsborg had even just become free from ice and would hardly be able to flower that year. But the specimens from N. Stromfjord were flowering abundantly, but we cannot say whether they were able to fructify or not, and we did not find old fruits¹. The plants were forming extensive patches totally filling the pool; in another pool just in the neighbourhood *Menyanthes*, equally rare in Greenland, predominated.

The specimens collected by us belonged to *j. typica* Gunnarsson, subf. *subglabra* GUNNARSSON: Bot. Nat. 1914 p. 218—219.

The above mentioned places represent the northern limit of the species in Greenland; south of the area from various places right down to the southmost of Greenland, but everywhere rare.

Hibernates under and in ice.

A 195. *Potentilla (Sibbaldiopsis) tridentata* SOL.

In sandy and poor heath and on rocks.

Disko: Recorded from Godhavn (Lyngmarken) by R. BROWN and HART, but, according to SIMMONS, the specimens belong to *Sibbaldia*. Also by MEEHAN. In vain searched for by us during many years. — Behind Skansen $69^{\circ}25'$ (P.) on tertiary sandstones.

Mainland: Atå about $69^{\circ}45'$ (Th. P.); from several places near Jakobshavn Icesfjord (P.). Pâkitsoq fjord $69^{\circ}28'$ in several places (Bg.; P.) From Jakobshavn Icesfjord southwards more frequent, but always far from the coast. In N. Stromfjord and south hereof common.

A southern type. The above mentioned places represent the northern limit of the species. In South Greenland sometimes ascending to 6—700 m.

Flowers abundantly, but develops hardly any fruits in the northern parts of its range.

Undoubtedly sometimes snowless during winter.

¹ In H. H. I have only seen unripe fruits on one specimen from the southmost Greenland.

196. **Potentilla (Argentina) anserina** L. coll.

The opinions, as to the systematical value of the Greenlandic forms of this collective species, vary very much. Here I follow the classification given by the last monographer of the genus TH. WOLF (Monographie der Gattung Potentilla 1908).

I. Folia subtus dense pilis longis adpressis tomentum verum obtegentibus argenteo-sericea, nitentia, sepala externe plerumque 3 plurifida, raro integra.

Here a series of varieties, for instance, var. *vulgaris* HAYNE.

II. Folia aut subtus glaberrima, aut tomento vero niveo obtecta, non nitentia vel super nervos pilis brevibus sericeis micans (prævalente semper tomento opaco); sepala externa fere semper integerrima, rarissime 2- aut 3-fida.

A. Folia et sepala subtus tomentosa, reliquæ plantæ partes aut modice pilosæ, aut glabrae.

1. Planta robusta, foliis maximis usque 30 cm et ultra longis, multijugis; tomentum foliorum intermixtis pilis sericeis brevibus micans.

var. *grandis* LEHM.

New Foundland, ? Greenland.

2. Planta mediocris vel parva, foliis 3—6 (—10) cm longis, 3—5 (—7) jugis, foliolis superioribus 1—2 cm longis, tomentum foliorum omnino opacum, ad summum quandoque secus nervos pilis sericeis paucis submicens.

var. *groenlandica* SER.

West Greenland to ca. 67°.

B. Folia et sepala utrinque glaberrima sicut plerumque reliquæ plantæ partes.

var. *Egedii* WORMSKJ.

(= *Argentina Egedii* RYDB).

West Greenland to ca. 71° N. Lat.

Of the forms accepted by TH. WOLF we have, as far as I can see, the following:

- 1) var. ***vulgaris*** HAYNE (variable, may be divided into several sub-varieties and forms). Not arctic, though occurring in South Greenland (if identical with *P. anserina* var. *communis* (LEHM) LANGE).

- 2) var. **grandis** LEHM. North-east Asia, North America, especially the western part, but also New Foundland and (? Greenland.
- 3) var. **groenlandica** SER. Arctic- and subarctic Europe, Asia especially the North-East, America, Greenland.
- 4) var. **Egedii** WORMSKJ. With the same distribution as the preceding, but in Greenland farther northwards.

Having no access, however, to WOLF's work here, but only to extracts from it, and as LANGE and later authors give another classification, I am only able to sketch incompletely the distribution of the forms in our area.

- 1) Var. *vulgaris* has never been seen by us nor reported from our area.
- 2) Var. *grandis* has been reported twice: from Sánerut in N. Stromfjord $67^{\circ}40'$ (Korn.) and from an islet in Sydost Bugt, $68^{\circ}35'$ (Htz.) By ROBINSON & FERNALD (GRAY's Manual 7th edition this form is merely considered a luxuriant state (of var. *vulgaris*?) in rich meadows. We have several times found large, luxuriant forms in rich manured soil, for instance, on an islet near Akúnâq, $68^{\circ}35'$, Isuamiut, $68^{\circ}42'$ and Ugssuit at the head of N. Strømfjord, $67^{\circ}50'$, but we do not doubt that they were only overmanured specimens of var. *Egedii* growing close by.
- ▲ 3) Of var. *groenlandica* SER. I have seen vigorous specimens, collected by OSTENFELD at Eqaluit, Ameralik-fjord, $64^{\circ}10'$. They were determined by KOLDERUP ROSENVINGE to the main-species, but the felt is dull and not covered by silky hairs. Similar specimens I possess from the island Ssolowetsk in the White Sea, collected by POHLE¹⁾; and in our area we collected them at Itivneq near Holsteinsborg, $66^{\circ}58'$.
- ▲ 4) Var. *Egedii* WORMSKJ. is declared by ROBINSON & FERNALD, (l. c.) to be a dwarf state, common on exposed rocks, whereas P. A. RYDBERG, the American monographer of the genus, keeps it as a distinct species (*Argentina Egedii* (Wormskj.) Rydb. It is the form best known to us.

Var. *Egedii* (WORMSKJ.) occurs only near the shore, as well on sandy or clayey as on rocky ground with scanty covering of earth, but, as a rule, only as high up the cliffs as they are periodically wetted by the surf.

Disko: Numerous localities are known, especially on the southern, western and northern coasts and in the fjords (P.).

Hare Ø (P.).

Mainland: from Marraq at the outflow of the big river on Nügssuaq peninsula, $70^{\circ}30'$ southwards, occurring in numerous localities, but nowhere common.

¹⁾ from the same place and by the same collector I have specimens of var. *vulgaris* with silky hairs over the felt.

A southern type, north of our area only once observed at $70^{\circ}40'$. The range southwards not known to us, as in the records it was ordinarily incorporated with var. *groenlandica*.

Flowers normally, and fruits are developed in favourable places. Besides locally dispersed by the widely creeping stolons.

During winter covered by thick layers of snow and ice, but is uncovered in the early spring by the action of the sea.

We are mostly inclined to follow RYDBERG in keeping *Egedii* as a distinct variety or subspecies as we have not found intermediate forms. We only saw the leaves quite glabrous or with few silky hairs, not with a dull felt. In proportion to the small size of the plant the stolons are relatively longer than in var. *groenlandica*.

V

197. *Potentilla pulchella* R. Br.

On the shore or near it, as well in sandy as in clayey soil, in open morainic and alluvial soil but probably only in the neighbourhood of the shore. Sometimes on or under fowling-cliffs, on the resting places of birds and near fox-traps.

Disko: The north-land from Qutdligssat ca. 70° to the mouth of the Nordfjord, not infrequent (P.).

Hare Ø (Nath.; P.).

Mainland: Nügsuaq peninsula from the mouth of the big river along the Waygat-coast, not infrequent (P.). The east coast of Disko-Bay, from several places, but scarce. Kangâtsiaq $68^{\circ}15'$ in the archipelago of Egedesminde (K.). Near Holsteinsborg $66^{\circ}56'$ (Lundager!).

A decided northern type, the last mentioned places the known southern limit of the species.

Abundantly flowering and fruiting.

Varies according to the quality of the habitat. Thus var. *elatior* LANGE is a luxuriant form from manured soil, as already stated by SIMMONS.

V

198. *Potentilla nivea* L.

Most frequently in stony soil, in fissures and on rock-shelves, but also in open gravelly places in the heath, rarer in manured soil.

Very common throughout the whole area. Widely ranging in Greenland without northern limit; a northern type, its continuous distribution stopping at 64° on a high-alpine locality; only once observed south hereof.

Within the area ascending to the snow-limit.

Often snowless during winter.

Varying very much, the varieties and forms often difficult to classify.

In the determination of my material I have employed the following arrangement extracted from the monograph of TH. WOLF, with a few omissions and still fewer additions, the last in [].

I. Folia fere semper ternata, crenata vel serrata ad tertiam, saltem non ultra dimidiam laminae partem incisa, dentibus latis, saepe remotis, plerumque obtusis; plantae super tomentum plerumque parce pilosae, nunquam dense villosae.

A. Foliola 1—2 (3) cm longa, late ovata vel subrhomboidea, basi non vel breviter cuneata, circumserata, fere aequa lata ac longa vel parum longiora; caules tenues erecti vel adscendentes, 5—20, raro usque ad 35 cm alti.

a. Foliola subtus tomentosa: Var. **vulgaris** (CH. & SCHL.)
Lehm. rare in Greenland.

b. Foliola laxe et tenuissime canescenti-tomentosa, subviridia.
Var. **pallidior** Sw. (= *subviridis* LEHM.)

A shade form of the preceding?

B. Foliola 2—5 cm longa, irregulariter et grosse sinuato-crenata dentibus magnis latis obtusis, quandoque margine subrevolutis, nervis rubescentibus; caules sat crassi, compressi, 20—30 cm longi, prostrati, floribus apice glomerato-cymosis.

Var. **prostrata** (ROTTB.) LEHM.

A form from shadowed and manured soil of the following?

II. Folia radicalia plerumque ternata intermixtis interdum quinatis. Foliola 8—15 [35] cm longa, intermedio quandoque petiolata, ultra dimidiam partem laminae aut fere ad nervum medium usque pinnatifida. segmentis sublinearibus aut oblongis acutiusculis, plerumque approximatis; plantae quandoque + dense sericeo-villosae.

A. Folia longiuscule petiolata, foliola oblonga, dente supremo prominulo, utrinque segmentis 3—7 subpectinatim dispositis; caules 20—30 cm longi, graciles, 2—5 flori, floribus 10—15 mm latis, plantae plerumque laxe pilis longis subvillosae.

Var. **pinnatifida** LEHM. (= *subquinata* LANGE. RYDB.)
Very common in Greenland.

B. Folia parva brevissima petiolata, foliola fere triangulari-cuneata vel rhomboideo-obovata, dente supremo vix prominente, segmentis angustis utrinque subflabellatim dispositis; caules 3—5 cm longi, firmi, subscapiformes 1—2 flori, floribus 18—20 mm latis; plantae dense caespitosae vel pulvinares, pilis longioribus + dense villosae.

Var. **uniflora** (LEDEB.) TIN. W. (= *arctica* (CIT. & SCHL.) LÖE.
P. subg. var. Pedersenii RYDB.)
 A common dwarf form of the preceding.

1. Var. **vulgaris** CHAM. & SCHL. (an ... *vulgaris* LEHM. LANGE: Conspectus p. 8).

In Greenland much rarer than var. *pinnatifida*. Ordinarily the plants are slender, — rather like specimens from the Alps, — but we have also from luxuriant localities, for instance, Engelskmandens Havn on South Disko, seen vigorous, stout forms. If identical with the var. α of LANGE it should be widely distributed in West Greenland. We have only a few specimens from South Disko and Diskofjord.

2. Var. **pallidior** Sw. (= γ *subrividis* LEHM., LANGE l. c. p. 9) is probably a shade form of the preceding, occurring in copses or among tall grasses.
3. Var. **prostrata** ROTTB. As to this doubtful and rarely collected form, OSTENFELD (Medd. om Gr. 43, p. 27) has made the suggestion that it might be a luxuriant form of var. *pinnatifida* from manured soil, to this opinion we can subscribe; we may, however, point out that we did not observe specimens containing all of the distinguishing characters: coarse, prostrate and flattened stems, large leaves with scanty felt, purplish ribs and revolute margins and glomerate flowers. Specimens of v. *pinnatifida* from soil manured to excess are often prostrate with flattened stems and large leaves. When at the same time the plants grow in the shade, the leaves are less tomentous, but then the flowers are, as a rule, undoubtedly longstalked. The type specimens of ROTTBOLL were sent to him from SVERDRUP, missionary at Disko Bay 1764—88, and one specimen is said to exist in the herbarium of POUL EGEDE, missionary at Disko Bay 1736—40. The last mentioned collection belongs to the Botanical Garden at Copenhagen and probably this and other types of ROTTBOLL's plants may still exist. The specimens collected by HOLBOLL, at Umánaq and mentioned by OSTENFELD l. c. were collected between 1825—28!

Besides ROTTBOLL's specimens (collected near Jakobshavn or Christianshaab?) the var. *prostrata* has been recorded from Uperniviarssuk 73°28' (RYDER). RYDBERG (l. c. pag. 180) considered this plant as belonging

to *P. emarginata*. Other records exist from Godhavn (MARGRETE SMITH) and Christianshaab (V.), and we can add Umánaq (LUNDAGER) and Jakobshavn (A. P. OLSEN). The flowers of the last mentioned specimen are glomerate, but the flowering is in its very beginning. The specimens of LUNDAGER have pedunculate flowers, but the ribs are not purplish.

4. var. **pinnatifida** LEHM., Th. WOLF, emend. (Syn. *P. quinquefolia* Rydb. Mem. Dep. Bot. Columb. Univ. 1898. *P. subquinata* Rydb. Bull. Torr. Bot. Cl. 28 p. p. 181, 1901 *P. nivea* & *subquinata* LANGE, Conspectus Fl. Groent. p. 9, 1880.)

The common form in our area. Exceedingly varying according to the conditions of the habitat. As a dwarf form from dry rocks with scanty snow covering during winter, we consider:

5. var. **uniflora** (LEDEB.) Th. W. (Syn. β *arctica* Cham. & SCHL., LANGE l. c. *P. subquinata* var. *Pedersenii* RYDB. Bull. Torr. Bot. Cl. 28, p. 182 and probably var. *arenosa* TUREZ., LANGE l. c. p. 236 = *P. nivea altaica*, BUNGE, RYDB., l. c. p. 181.) The range of this form is in our area, identical with that of 4, with which it is connected through numerous transitions. The most extreme forms are densely tomentous and with few flowered stems, recalling the aspect of *P. Vahliana*. In fact TH. WOLF placed the var. *Pedersenii* as a synonym under *P. Vahliana*, although the pubescence is pure white and not yellowish, the flowers smaller etc.

Summarizing the above remarks there are — in our opinion — only two unities of a higher order in our area, viz. a common: *P. nivea pinnatifida* and a rare: *P. nivea vulgaris*. Whether they are independent, hereditary constant species or subspecies or only varieties of the same species we cannot at present say. The decision must be left till future observations and cultivating experiments have settled the point.

V 199. **Potentilla Vahliana** LEHM.

On dry sand and gravel, rarer in stony soil.

Disko: Very common, especially on the north-land, but also in alpine stations or on barren basalt-gravel on the south coast to $69^{\circ}15'$ (P.).

Hare Ø (Taylor; P.).

Mainland: The basalt- and sandstone-domaines of Nügssuaq, common; south of Torssukátaq at Ritenbenk (V.; Bg.) ca. $69^{\circ}45'$ and quite isolated on the Præstefjæld at Holsteinsborg $66^{\circ}55'$ (W. & H.).

A decided northern type. The above mentioned localities are the southern limit of the species.

Ascends the hills to the snowline.

Abundantly flowering and fruiting; it is one of the first flowering, most beautiful and largest spring flowers of Disko.

Usually snowless during winter, the live buds protected by a dense covering of withered leaves.

A

200. *Potentilla Ranunculus* LANGE.

In vigorous meadows.

Disko: Kûgaq at Mudderbugt 69°45' (Htz.); several times re-found here (P.).
Mainland: Majorqarssuatsiaq 70°10' (Bg.).

For the rest only once collected on the east coast of Greenland 63°40'.

Outside Greenland only known from the sub-arctic part of Eastern America, hence it must be settled as a decided southern type.

Flowers abundantly, but fruits are only developed in good summers.

Hibernates covered by snow.

V

201. *Potentilla emarginata* PURSH.

In fell-fields, gravelly and rocky soil, herb-mats and sometimes in heath.

Disko: Common on the north-land and in the two northmost fjords. In Diskofjord and on the south coast scarce, usually alpine or in barren places in the low-land (P.).

Hare Ø (P.).

Mainland: Nûgssuaq peninsula, common; especially in the basalt- and sand-stone-domain. South of Torssukâtaq rare. Ritenbenk (V.); Jakobshavn (Bg.); Manitsoq at Egedesminde (K.); N. Stromfjord (Korn.); not found by P. & E.); N. Isortoq (Korn.) Præstefjeld at Holsteinsborg 66°55' (Htz.) only alpine.

A northern type, the above mentioned localities represent the southern limit. Ascends the hills to the snowline.

Flowers and fructificates abundantly.

Often snowless during winter. Not much varying. In moist places a tall form occurs with large, dark-green leaves, leaflets obtusely dentate. On dry rocks the forms are low and stunted, yellowish-green, with acute teeth. (Cp. ABROMEIT pag. 8 et sq.).

A 202. **Potentilla alpestris** HALL. fil. (Syn. *P. maculata* POURR.; *P. Langeana* RYDB.).

In herb-mats and copses.

Disko: Rather common on the south coast. In Diskofjord on the north coast and at the hot springs of the south coast. On the north coast of Mellemfjord to 69°45'; from Mudderbugt to Kvandal behind Ujaragsugsuk 69°45' (P.).

Hare O. The south coast, scarce 70°22' (P.).

Mainland: Ritenbenk 69°45' (V.); Jakobshavn (Sor.); Egedesminde (Sor.). On the mainland s. o. Ikamiut island 68°23' common (P. & E.).

A southern type, the above mentioned localities represent the northern limit of the species in West Greenland.

All the mentioned localities in the lowland.

Abundantly flowering and fruiting.

Hibernates covered by snow.

Rather variable, some of the forms certainly depending on the quality of the habitat. *Var. hirta* Lange is in well-marked forms a rather deviating type, by RYDBERG l. c. p. 179 considered an independent species: *P. Langeana* Rydb.; it is distinguished by several flowered cymes and the long pubescence of the leaves, but also by the more acute teeth, the longer and more acutish bractlets and narrower sepals. This form seems to be more common than the mainspecies; it is sometimes very tall and robust.

As most of the numerous European forms of the comprehensive collective species *P. alpestris* are constant in culture, the same may perhaps be the case with this.

P. rubens Vill. is recorded from Godhavn by ROWLEE & WIEGAND; but as this Mediterranean species has been found nowhere else in Greenland I am inclined to refer the plant to the form-circle of *P. alpestris*.

• 203. **Potensilla Friesiana** LANGE.

This remarkable plant has only once been recorded from Kuánerssuit in Diskofjord 69°35' (Th. Fr.)

In vain I have searched for it here during many years. Of the recent monographers of the genus RYDBERG accepts it as a valid species rather deviating from the other ones; but TH. WOLF reduced it to a form of *P. alpestris*. The most remarkable characters is the dense glandular pubescence. But as *P. emarginata* also normally shows a glandular covering (see ABROMEIT l. c., KNUD JESSEN, Medd. om Grl. 37, p. 39). I feel rather inclined to consider *P. Friesiana* a luxuriant form of this species or a hybrid between *P. emarginata* and *P. alpestris*, both growing plentifully at Kuánerssuit.

!

204. *Dryas integrifolia* M. Vahl.

In heath, sandy and gravelly soil, often at the borders and in the deltas of glacier-torrents washed down from the highlands; also on fresh morainic soil and in fell-fields.

Very common throughout the whole area.



Narrowleaved, highland specimen of *Dryas integrifolia* with new shoot, representing the f. *intermedia* NATH. From gravel-bank in a river delta.

Widely distributed in West Greenland and without northern limit, also found in the southmost Greenland but, according to ROSENVINGE, very scarce south of 64°. Hence a northern type.

Abundantly flowering and fructifying.

Often snowless during winter.

Of the variations of the species, var. *intermedia* NATH. (Öfv. K. Sv. Vet. Ak. Förh. 1884, Nr. 1, p. 24) has been discussed several times, because the existence of this form has been considered a support of

the argument that *Dr. integrifolia* was only a variety of *Dr. octopetala*. This argument must, however, be discarded, because the var. *integrifolia* is merely an ecological form (The same view has been suggested by SIMMONS: Ellesmereland, p. 45). Plants with leaves larger than usual, with not revolute margins and better developed leaf-teeth occur in well watered and somewhat shaded localities. But the finest specimens are to be met with on gravelly banks in river beds. Narrow-leaved highland forms are often washed down and anchored here. The new shoots developed in this habitat are quite different: they represent the typical *intermedia*-form. Also the flowers developed under such favourable circumstances will hardly differ in size from *Dr. octopetala* (see figure).

On the poorest and dryest tertiary sandstones occur forms extreme in the opposite direction: the leaves are strongly revolute, linear, nearly ericoid.

Very different and without any transitions to the main-species is the var. *canescens* SIMM., of which I have published a figure Medd. om Grl. 50, p. 379, fig. 13. It is very rare. In our area we only observed it in valleys to the head of Nordfjord on Disko $69^{\circ}55'$ and at Marraq near the mouth of the big river of Nûgssuaq peninsula $70^{\circ}30'$. The very few records, previously known, are all north of our area, and this variety may perhaps be considered a high-arctic type.

A 205. *Alchimilla alpina* L.

In herb-mats and on luxuriant slopes.

Disko: Near Godhavn (?) (Tarr. & Martin); in Blæsedalen (Th. H.), during many years searched for by us, but in vain.

Mainland: N. Isortoq $67^{\circ}15'$ (Ros.); Præstefjældet near Holsteinsborg (W. & H.); P. & E.); Amerdloq about $66^{\circ}55'$ (W. & H.).

A decided northern type; the above mentioned localities represent the northern limit in West Greenland. Common south of 64° (Ros.).

Our specimens were not flowering Aug. 6. 1914 (an unfavourable summer), but the specimens had fruits from the preceding year.

Hibernates covered by snow.

A 206. *Alchimilla glomerulans* BUSER.

In vigorous herb-mats on, Disko preferably at the hot springs and their outlets.

Disko: The south-land from Mudderbugt to Blaafjæld in all suitable places. In the valleys as well. Diskofjord: common at the hot springs and in a few other places. Mellemfjord: in a few places on the north side of the fjord, at Sarqardlit silardlit and Ikorfassuit ca. $69^{\circ}45'$. On the west coast in N. Laxebugt $69^{\circ}35'$ and $69^{\circ}42'$.

Mainland: Jakobshavn $69^{\circ}13'$ (W. & H.); Kangerdluarssuk at Agto (E. P.) $67^{\circ}55'$; N. Stromfjord $67^{\circ}40'$ (Korn.); S. Kangerdluarssuk, ca. 67° (W. & H.), in the fjords east of Holsteinsborg from several places, but not as common as on South-Disko (many collectors).

A southern type, the above mentioned localities represent the northern limit of the species in West Greenland. Common south of 67°.

All the mentioned places in the lowland.

Abundantly flowering and fruiting and attains to great vegetative power. Next to *Archangelica* it has the largest leaves among the plants of Disko, sometimes with a broadness of 12–15 cm and a midrib of 5–8 cm in length.

I 207. *Alchimilla minor* Huds. subsp. *filicaulis* (BUSER)

LINDBERG fil. (Die nordischen *Alchimilla vulgaris* Formen und ihre Verbreitung. Acta. Soc. Scient. Fenn. 37, Nr. 10, 1909).

Only found once in Amerdloq-Fjord at Holsteinsborg 66°55' (V.).

A decided southern type; the next following locality ca. 65° and only in the southmost part of the land fairly common.

Perhaps overlooked now and then or, in notes mistaken for the preceding.

XXVI. Callitrichaeae.

The *Callitricha*-species observed in Greenland occur near the borders of shallow lakes, often hid among the stalks of *Carex* species. The known localities lie rather isolated between 70° and 60°. As most of the aquatic plants in Greenland they must be settled as decided southern types.

If the numerous pools and ponds in the gneiss-domaines of Greenland were sufficiently investigated it would no doubt become apparent that the *Callitrichaceae* and other small aquatic plants have a rather continuous extension.

All the *Callitricha*-species, found in Greenland, flower and fructificate; hitherto they are only found in the lowland. They hibernate enclosed in ice, because of their occurrence in shallow places in the lakes, which freeze to the bottom during winter.

I 208. *Callitricha verna* (L.) KÜTZ. var. *minima* HOPPE.

Disko: Mudderbugt 69°45' (Htz.), the northern limit

Mainland: Jakobshavn 69°13' (Sor.); the archipelago of Egedesminde from Ikamiut to Qeqertarsuatsiaq, from several places (Kr.); Holsteinsborg (W. & H) southwards herefrom not observed till 60°—62°.

I 209. *Callitricha hamulata* KÜTZ.

Mainland: Archipelago of Egedesminde from Ikamiut to Qeqertarsuatsiaq, ca. 68°40' (Kr.); the northern limit. From this domain southwards not observed till 65°, 64°25' and between 60° and 61°.

1 210. Callitriche autumnalis L.

Disko: The north-west coast at ca. $70^{\circ}10'$ (P.); at the mouth of Nordfjord $69^{\circ}55'$ (P.); in pools in Blæsedalen at Godhavn $69^{\circ}17'$ (E. P.; Th. P.).

Mainland: Sermermiut at Jakobshavn $69^{\circ}13'$ (P.); archipelago of Egedesminde: in some places in the Nivåq-Bugt $68^{\circ}35'$ (Kr.).

Only found in the mentioned places in Greenland. The specimens from the two northmost places are very small; the leaf-bearing sprouts only 15—35 mm long with 8—14 pairs of leaves. The leaves 5—10 mm long, 0,4 · 0,8 mm broad. But the specimens from Blæsedalen sometimes become 20 cm long in favourable summers.

Also in Greenland a perennial.

XXVII. Empetraceae.

1 211. Empetrum nigrum L.

In heath, moss-bogs, sometimes at the edges of willow-copses.

Very common throughout the whole area.

Widely distributed in Greenland, without southern limit and perhaps also without northern limit.

From the coast ascending to considerable altitudes, but not as far as, for instance, *Cassiope tetragona*, and never as a pioneer on fresh morainic soil.

Abundantly flowering and fruiting.

Normally covered by snow during winter.

Empetrum is the most important heath-species for the natives, who use it for fuel; the berries are commonly gathered and eaten.

XXVIII. Onagraceae.

A 212. Epilobium anagallidifolium (L.) LAM.

In open spots in moist heath, moist places in fell-fields, often on fresh moraines, along water-courses; sometimes in herb-mats.

No doubt often overlooked because of its diminutiveness.

Disko. On the south-land and the valleys here, Diskofjord and Mellermijord known from many places; undoubtedly rather common. In valleys from the head of Nordfjord, common; the north-west coast, rather common far from the coast (P.).

Mainland: Paotût $70^{\circ}12'$ (Htz.); southwards not observed till N. Isortoq $67^{\circ}15'$ (Ros.) and Holsteinsborg $66^{\circ}55'$ (W. & H.); no doubt overlooked.

A southern type; north of the area found a few times up to $72^{\circ}8'$ (P.). Also overlooked south of the area; it seems to prefer the coast-region, not being able in competition to hold its own.

At Paotùt ascending to 800 m.

Flowers and fructificates abundantly.

Hibernates covered by snow.

A 213. *Epilobium lactiflorum* HAUSSKN. (*E. alpinum* TRELEASE: Revision of the American species of *Epilobium* Rep. Miss. Bot. G. L. 1891).

Very rare in the area, only at hot springs, in very moist places among mosses.

Disko: Lyngmarken (V.; Th. Fr.; P.); Engelskmandens Havn (P.); Kuánit (Th. P.), Torskenes (Th. P.); Mellemfjord, Kuánit and Ikorfassuit $69^{\circ}44'$ (P.).

A decided southern type, north of the area found once at Kük $70^{\circ}40'$ (Vh.). South of the area observed at $64^{\circ}10'$ and from several places between 69° and 62° (Ros.).

Abundantly flowering and fruiting. Forms winter-buds.

Abundantly covered by snow and ice during winter.

A 214. *Epilobium Hornemannii* REICHENB.

In similar places together with the preceding, but much more frequent.

Disko: The south-land from Mudderbugt westwards, Diskofjord, N. Laxebugt, the north side of Mellemfjord at most of the hot springs (P.). The Waygat-coast at the springs of Únartorssuaq $69^{\circ}50'$ (P.).

Mainland: At the hot spring on Sarqardlit at Egedesminde $68^{\circ}40'$ (P.); Sarfarssuaq in N. Stromfjord $67^{\circ}50'$ (P. & E.); Præstefjeld at Holsteinsborg $66^{\circ}55'$ (W. & H.); from here not observed southwards till Godthaabsfjord and South Greenland 60° — 62° .

A southern type, the mentioned places represent the northern limit in Greenland.

Abundantly flowering and fruiting in not too cold summers. Forms winter-buds.

Hibernates covered by snow and ice.

At Kuánit in Mellemfjord $69^{\circ}43'$ TH. PORSILD collected a specimen just flowering, July 9. 1911, deviating much from the normal *E. Hornemannii* by its large and broad leaves. It resembles *E. alsinefolium* from Iceland, leg HELGI JÓNSSON, very much. ROSENVINGE has observed similar presumed transitorial forms in South Greenland, see Tillæg p. 660.

I 215. *Epilobium palustre* L. var. *labradoricum* HAUSSKN.

In similar places, often together with the preceding, but much rarer.

Disko: Near Godhavn (Bg.); Engelskmandens Havn (P.); in valleys at Skansen $69^{\circ}25'$ (P.).

Mainland: N. Stromfjord, Eqaluarssuit $67^{\circ}36'$ (P. & E.); herefrom not observed till Godthaabsfjord, and southwards more frequent.

A decided southern type; the above mentioned places are the northern limit.

Usually flowering and occasionally fruiting. Forms winter-buds.

Hibernates abundantly covered by snow and ice.

A 216. Chamaenerium angustifolium (L.) SPACH.

(*Epil. spicatum* LAM.).

In herb-mats and at the edge of copses.

Disko: The south coast, near Godhavn, eastwards along the coast in several places; at least east of Skansen $69^{\circ}25'$; the inner part of Diskofjord on the northern side $69^{\circ}30'-35'$.

Mainland: Christianshaab $68^{\circ}45'$ (Giesecke); s. o. Manermiut $68^{\circ}30'$ (K.); N. Stromfjord; Tiggaaq (Sor.), Eqaluarssuit $67^{\circ}36'$, very scarce (P. & E.); N. Isortoq (V.); S. Kangerdluarssuk (W. & H.; Ros.); in the neighbourhood of Holsteinsborg and in the fjords from several places, but everywhere scarce. Not common till south of 64° (Ros.).

A southern type; the above mentioned places represent the northern limit. Records from Upernivik, by KANE, must be considered as improbable.

Within the area only in the lowland.

Usually late, but abundantly flowering; but strange to say it is nowhere in Greenland observed fruiting, hence totally deprived of the power of migration.

The variety *intermedium* (WORMSKJ.) LANGE, as defined by LANGE seems to me hardly to deserve the name. I rather suppose that WORMSKJOLD has been thinking of a hybrid between *Ch. angustifolium* and *latifolium*.

I 217. Chamaenerium latifolium (L.) SPACH.

In very different kinds of soil, but most vigorously on sand in and by water-courses and river-deltas. Here it forms extensive patches, visible far away during the flowering season. Also in not too dry heath and fell-field.

Very common throughout the whole area.

Widely distributed in Greenland with neither northern nor southern limit, from the coast ascending to the snow-fields.

Abundantly flowering, and in the lowland often fruiting, but frequently so late that the capsules usually do not open till the fall of snow. Often washed down from the highland by brooks.

Perhaps sometimes snowless during winter.

Varies according to the quality of the habitat. The variety *steno-*

petalum Hausskn. (*tenuiflorum* Th. Fr. & Loes.) seems to lie within the limits of variation of any patch and thus hardly to deserve the name.

On the other hand the var. **albiflorum** Nutt. is hereditary constant. This fact may especially be observed at the borders of river beds, where a series of colonies may be started from a single patch and occurring along one branch of the river, but not along the others.

• 218. **Chamaenerium ambiguum** Th. Fr. & LANGE
(? *Ch. angustifolium* \times *latifolium*).

Strange to say this presumed hybrid has only been observed on Disko, but in return rather often. In Lyngmarken at Godhavn it has been found at least five times, and at Sinigfik 69°22' also rather often; but it seems only to occur in few specimens. I have not been so fortunate as to find it myself in spite of intense searching in places where both species were growing side by side. The specimens from Sinigfik were collected flowering, Aug. 11, 1907, and the collector (L. GEISLER) adds the information that it was growing among *Ch. latifolium* and *Ch. angustifolium*, and that the last was not yet flowering. Its ovaries are big like those of *latifolium*, but they shrink in drying, and the ovules shrivel completely; thus it seems incapable of fruiting.

XXIX. Halorrhagidaceae.

1 219. **Myriophyllum spicatum** L. var. **capillaceum** LANGE.

In ponds and pools.

Only observed a few times. Sofiehavn at Tasiussarssuaq 68°25' (BL); Itivneq at Holsteinsborg (W. & H.); in a lake at the head of S. Stromfjord 66°55' (Jens.); found a few times at Ikeraasak 70°30' (S. H. Vh.).

A decided southern type in Greenland; only known from the mentioned places.

Some of the specimens from Ikeraasak collected by VANHOFFEN were flowering already on the July 22, and therefore I suppose it may be able to fructificate.

Hibernates under ice.

XXX. Hippuridaceae.

Λ 220. **Hippuris vulgaris** L.

Will hardly be wanting in any smaller lake or pond which do not dry up during the summer. It is the most common and widest distributed aquatic plant of Greenland.

In West Greenland known from Cape Farewell to $70^{\circ}30'$, but being found at 77° on the east coast, this place can hardly be the northern limit.

Usually abundantly flowering, but not all the fruits ripen; where the pond is frozen up with early night-frost all the shoots, protruding above the ice, are killed.

Does not vary much. The form var. *maritima* (HELENIUS) HARTM., supposed to be identical with *tetraphylla* L. fil., is recorded the most common in Greenland. Typical forms of var. *tetraphylla* with few short and broad leaves are, however, rather scarce. Well developed specimens collected towards the termination of the summer seems to me not much deviating from the European form.

The same is said by OSTENFELD of specimens from East Greenland (Medd. om Grønland. 43) and by AGNETE SEIDELIN of the great majority of the investigated arctic specimens (ibid. 36, p. 302). The latter author refers it to f. *litoralis* Lindb. fil.

Cornus suecica L.

Recorded from Egedesminde Ø as collected with ripe fruits Sept. 28, 1893 by P. H. SØRENSEN; on the label is noted that the plant also occurs at Godhavn. In both places I have searched for it during many years, but in vain; and it is very difficult for me to believe that such a conspicuous rare plant, whose fruit, moreover, is a berry, might really be overlooked in this place where I have lived and collected for 13 years. In West Greenland it is only known from 60° — 62° and 64° — $65^{\circ}47'$. Neither is it met with in the southmost part on the outer islets (Ros.).

XXXI. Umbelliferae.

A 221. *Archangelica officinalis* HOFFM.

On luxuriant grassy slopes where the cover of snow is constantly recurring, but early disappearing and, where during the period of vegetation, there is an abundant supply of pure running water; on Disko only near the hot springs and their outlets. The most prominent representative of the southern types and always found together with several others.

Archangelica is the largest and most conspicuous herb in Greenland and would, if only for this reason, easily be recognized by anybody. But as it, moreover, is much coveted by the natives who eat its young stems and leaf-stalks raw, often undertaking long journeys and troublesome excursions to gather it, the determination of its area of distribution

is far easier than that of any other plants, a trustworthy information, as to its occurrence or absence, can be had in any locality.

To the following account I have used, besides literature and personal investigations, a good deal of information, mostly verbal, from natives of the different localities. Most complete and most reliable are the informations relating to the Disko-fjord which all are due to Isak Danielsen, an Eskimo, who is conspicuous for his remarkable aptitude for geography. On a map, drawn by himself, of those parts of the Disko island known to him, he has on my request, among other things, marked the occurrences of *Archangelica* known to him. — In the enumeration of the occurrences, an (!) indicates that I have seen the spot myself, or, at any rate, the plant from there.

To facilitate the comprehension of some of the place-names in the following account I will just point out, that the Scandinavian word for *Archangelica*: *Kvan* already in the olden times was adopted into the language of the Greenland Eskimos in the form of *kuáneq*, plur. *kuánit*. From this the following forms are further derivations: *kuánínguit* i. e., the small (or few) *Kvans*, *kuánerssuit* i. e. the large (or many) *Kvans*, *kuánikasít* i. e. the poor *Kvans*, *kuáníárssuit* i. e. the extraordinary (or remarkable) *Kvans* etc. etc.

Disko.

I. Mellemfjord.

On the northern shore, at Kuánit, $69^{\circ}44'(!)$ in a rich and luxuriant herb-mat at the outflow of several springs together with *Cystopteris*, *Polystichum Lonchitis*, *Poa alpina*, *Luzula parviflora*, *Sibbaldia*, *Alchemilla glomerulans*, *Potentilla alpestris*, *Stellaria borealis*, *Epilobium lactiflorum*, *E. Hornemannii*, *Pirola minor*, *Bartschia*, *Veronica alpina*, *Taraxacum croceum* etc. — Further at the head of the fjord, as well as on the southern shore near the hot springs (K. J. V. STEENSTRUP, Medd. om GrL. 24, p. 287).

II. Nordre Laksebugt (Eqaluit).

In the valleys some kilometers away from the coast near the foot of the mountain Igdlorssuaussaq, $69^{\circ}38'$, also in luxuriant herb-mats (P.).

III. Disko Fjord.

1) The north coast of the northern branch at $69^{\circ}34'-35'$, in four spots, the two westernmost ones near the small islet Qeqertárssuk, the largest and eastmost opposite the north point of the big island Qeqertaq. Here together with the same as above and with *Dryopteris Linnaeana*, *Habenaria hyperborea*, *Linnaea borealis*, *Hieracium groenlandicum*(!) — 2). In the northward directed branch are two localities on the eastern shore, at ca. $69^{\circ}32'$, one of them is named Kuánikasít(!). In the valley leading from this branch to Mellemfjord are 4 or 5 localities on the northern side of the valley, $69^{\circ}38'$. — 3) In the branch Kangerluarssuk, inland from Eqalúnguarqat, $69^{\circ}31'(!)$ as well in the valley Eqalúnguit Itivnerit leading from this branch to the fishing place Eqalúnguit, in numerous spots (!). Along the foot of the hill 3125' of the map, on its southern side, is a widely extended occurrence of *Archangelica*, the western end of which is called Mamartut (the well-tasting), the eastern Qiterdlít (the middle ones i. e., in proportion to the following). — 4) At the inner branch

of the fjord along a brook from the hill 3125' to the bay at Eqalunguit; here the occurrence is called Tiggait (the unpleasant smelling). Somewhat eastwards are several smaller localities near the same hill and in a valley leading behind the northern side of the hill to Avdlångissat is a very large occurrence of the plant at 69°36'. Farther inwards at the same branch the occurrences of *Archangelica* extend with small interruptions from Orpit to Kuánerssuit at the head of the branch. The last mentioned locality I have described elsewhere (Medd. om Gr. 25 p. 188—98). As far as botanical literature is concerned, the word Kuánerssuit denotes the northern shore here, but, according to the traditions of the natives, the name refers to the shore inside the very head of the branch. This place is now inaccessible during summer because of the filling up of the fjord by the action of the torrents here. The *Archangelica*-plants are here said to reach a size so large that the stems will project when carried in the skin of a fullgrown saddle-back seal. — At Angujartutit, where the shore of the same bends in a south-westerly direction, is an area with numerous hot springs, 5—6 kilometers in length and more than one kilometer wide. *Archangelica* grows over the whole area, the biggest occurrence I have seen. — 5) In the southwestern branch of the fjord, *Archangelica* occurs at three spots, one somewhat inside Ikineq, 69°29'(!) the other about midway between that place and Nängissat. — 6) In the branch Kangikitdeq are two localities at the head of the branch near the valley leading northwards, 60°28' and one on the southern shore, Kuánikasit, 69°27'. — 7) Finally *Archangelica* occurs on the southern shore of Qeqertaq, at 69°29' and on the southern shore of the fjord proper, inside Nipisat Bay, 69°25', whereas it is wanting at the hot spring Únartoq on that shore.

IV. South Coast of Disko and valleys hereof.

Along the shore at the foot of the mountain Blaafjæld (Uivfak) about 54' Long. W. *Archangelica* occurs in small quantities in several places, turning round the southeastern corner of the mountain, where they grow denser and reaching up the valley Itivdleq, ending at the valley Tukingassoq, leading behind Blaafjæld. — From Kangerdluarssuk (Fortune Bay) to Augpilagtungaq are 4 or 5 small occurrences. From here they occur almost continually over Quvnermiut (!) to Engelsmandens Havn, 69°15' near Godhavn. In Lyngmarken only a few individuals occur. In Osterdalén and at the springs in that valley *Archangelica* was absent, but several years ago seeds were sown here (E. P.) and seedlings are found. In Blæsedalen *Archangelica* grows from the foot of the mountain Skarvefjæld and half-way to the fjord, but scarce (!). At the foot of the said mountain, towards the sea, we have a very luxuriant locality, named Kuánit, often mentioned and figured because of the picturesque basalt-columns. Farther eastwards near the cliff Per Dams Skib (Asungsungåq) we find *Archangelica* at a considerable height over the sea. Also at the mouth of Brede Dal, 69°18' the plant occurs in plenty (!).

From Brede Dal eastwards *Archangelica* occurs at Puflassisunguaq (!), Taserřssuk and Sinigfik, 69°19'—20'(!), Marrait, Kigdlüssat and Sarqarssuaq, 69°20'—22', Tuapait 69°25' and in a valley inside the settlement of Aumarutigssat, the river of which ends at Kigdlusaisut nūat. From this point eastwards towards Mudderbugt no occurrences are known.

V. Mudderbugt and valleys to that bay.

Archangelica occurs on the southern side, rather far from the shore, 69°40', and on the northern side, also at same distance from the bay. HARTZ has, in Medd. om Gr. 15, p. 55, given a description of the place and its vegetation. Finally at the head at the largest valley to Mudderbugt, Kvandal behind Ujaragsugssuk, ca. 69°47', described by PORSILD, l. c. p. 153. This place is the northernmost known in

Greenland, only in Norway the plant occurs farther north, $70^{\circ}11'$ (NORMANN: Norges Arktiske Flora I, 1, p. 317¹). Strange to say this occurrence is at the same time one of the most elevated known in Greenland, namely 550 m above the sea. Only at Angmagssalik in East Greenland KNUST records a higher station.

On the Waygat-coast of Disko *Archangelica* does not occur, neither in the big valleys nor near the hot springs at Uartoq and Unartuarssuk. About the big valley of Kügänguaq GRESECKE remarks: „*Archangelica* wächst im Thale in beträchtlicher Menge, but I have convinced myself about the incorrectness of that statement. I may point out here that the work of the celebrated author, given in the form of a diary, is not written in the field, but during his winters in Greenland, may partially in Denmark after his return, and several minor inaccuracies, also in geographical and other respects are due to slip of memory.

The Mainland of West Greenland.

In his Conspectus Fl. Groenl. Tillæg p. 259 LANGE records *Archangelica* as common to 69° , but in the second supplement p. 682 ROSENVINGE corrects this statement and records S. Kangerdluarssuk, $67^{\circ}0'$ as the northernmost locality on the mainland. Besides it was known from Ikertôq-fjord $66^{\circ}45'$, but nowhere else recorded by the numerous collectors who travelled in the district of Holsteinsborg; we found the plant at one new locality here, viz. Naujarssuit in Qeqortalik-bay $66^{\circ}44'$ (P. & E.), but we omitted to collect information from the natives.

The plant does, however, occur farther northwards, thus at several places in N. Stromfjord and therefore undoubtedly also in the N. Isortoq-fjord, lying between the two areas. We shall here mention in full the localities seen by us or mentioned to us by the natives. Most of our records are due to the native ANDREAS BRANDT at Kangâtsiaq, who marked for us every occurrence, known to him or to his much travelling countrymen, in a map of large scale.

I. Nordre Stromfjord and its branches.

1) South Coast of mainbranch: south of Taseralik, $67^{\circ}25' N.$, $53^{\circ}30' W.$; Tiggak, $67^{\circ}32'$ (plants seen by us!); Eqaluarsuit $67^{\circ}33' N.$, $53^{\circ}8'$ and $67^{\circ}35' N.$, $52^{\circ}58' W.$ (E. P.); Uksuk in Ungöriarsifik $67^{\circ}45' N.$; east of Sérchinilik $67^{\circ}40' N.$, $51^{\circ}32' W.$; Naujalik, $67^{\circ}48' N.$, $51^{\circ}18' W.$; east of Sánerut $67^{\circ}38' N.$, $50^{\circ}58' W.$; West of Qarlinguit, $67^{\circ}37' N.$, $50^{\circ}50' W.$.

2) North coast: north of Kavfit nûat, $67^{\circ}38' N.$, $50^{\circ}30' W.$; at $67^{\circ}35' N.$, $50^{\circ}38' W.$; at the head of Kordlortoq, $67^{\circ}39' N.$, $59^{\circ}35' W.$; point north of Kordlortoq, $67^{\circ}38' N.$, $50^{\circ}47' W.$; point west of Ujarasugssulik $67^{\circ}40' N.$, $50^{\circ}52' W.$; Ipiutarssuaq $67^{\circ}43' N.$, $51^{\circ}2' W.$

3). Sarfarssuaq-branch: east of Ivnalik $67^{\circ}43' N.$, $50^{\circ}53' W.$ (P. & E.). Kuáníarssuit, $67^{\circ}44' N.$, $50^{\circ}40' W.$

4) Qarsorsaq-branch: at the head, about $67^{\circ}52'$.²

¹) In a paper: Über die Engelwurz. Schweiz. Wochenschr. f. Chemie u. Pharmacie 1901. M. RIKLI has felt himself called upon to correct my statements, but he has certainly first and foremost saddled me with the mistake which he corrects. A critic ought, at any rate, to be able to read aright!

²) The existing maps are here very deficient, large branches are only loosely suggested, but not correctly. Hence the positions of this and some of the subsequent localities are rather uncertain.

5) Nuersorfit-branch, eastern shore at Upernivik, $67^{\circ}52' N.$ $51^{\circ}7' W.$ (P. & E.) and at Sikut, $67^{\circ}55' N.$ $51^{\circ}10' W.$ as well as a locality on the peninsula Qeqertaussaq at nearly the same latitude.

II. Arfersiorfik-fjord: at the head of a small islet at $68^{\circ}5' N.$ $52^{\circ}5' W.$ Northern limit?

III. Ataneq-fjord: Kuánit near Qajuvifik on the southern shore and nearly opposite at Kuáninguit, somewhat west of Oqorutit. The position of both places unknown to us.

IV. Environs of Agto: eastern shore of the sound behind the island of Kangeq, $67^{\circ}42'-48'$; at the head of the small fjord Inuarutdligkat, east of the settlement of Agto, $67^{\circ}55'$; (plant seen by us!). (absent however in the fjord Kangerdluarssuk a little northwards (E.P.)); bay of Táterait south of the settlement of Aqigsserniaq $67^{\circ}50'$.

The vegetative power of the Kvan appears to be comparatively uniform everywhere, perhaps it is somewhat greater on Disko than in the parts of the mainland treated of here. The Greenlanders often make a distinction between the taste of the Kvans from the different occurrences, and some of the place-names refer to this. In some places the Kvans are stated to be acrid (perhaps on account of anthocyanine and tannic acid?). The Eskimos greatly prefer the so-called »male« Kvans i. e. flowering specimens, whilst the »female« Kvans, plants which have not yet attained to flowering, are despised.

KRUUSE states (Meddelelser om Gronland 30, p. 248) that the Kvan in several places near Angmagssalik must be supposed to have become extinct through excessive gatherings in the places most easy of access. We have not observed any distinct analogous cases of this kind, but it might be permissible to conclude that it is the case in Lyngmarken, where there has been an extravagant cutting down of the bush for more than 200 years, on account of which other southern plants undoubtedly have suffered severely. The Kvan is here exceedingly scarce. On the other hand so was also the state in 1870 according to BERGGREN.

In every locality known to us the Kvan flowers abundantly and fruits, too. Most frequently, however, only the earliest developed umbelllets attains to ripening of their fruits, while all the others are overtaken in the autumn by the night-frost, often still in the state of flowering, and consequently killed. In winter the withered stalks of the Kvan are to be seen projecting above the snow, full of unripe fruits that have lost their power of germination. However, the numerous seedlings, found on every Kvan-slope, seem to indicate, that every year some of them attain to ripening.

The fruits are, of course, easily dispersed by water from the spring and carried down to the coast; on the other hand the power of dispersal over land seems to be exceedingly slight, although the large winged fruits are relatively very light. It is very common to see two grassy

slopes, apparently equally luxuriant and under equally favourable conditions, parallel and close to each other, one of them containing Kvans, the other not.

Archangelica hibernates under thick layers of snow, often, but probably not always, with its root in soil that never freezes. On large root-specimens the terminal bud is larger than a clenched hand and contains a complete inflorescence. A little farther down several smaller buds are to be found in the axils of former leaves. KRUTSE states l. c. p. 246: »the specimens die after having set fruit«, hence it ought to be hapaxanthic. Another common appearance here is: an old root, that without any apparent cause, is decayed right down, but hence the axillary buds are set free, and the plant consequently perennial, being also ordinarily indicated as such in the Scandinavian Floras.

XXXII. *Pirolaceae.*

I

222. *Pirola minor* L.

In copses and vigorous herb-mats, on Disko usually in shade; not in the heath.

Disko: Rare, perhaps sometimes overlooked; in the vicinity of Godhavn $69^{\circ}15'$, for instance in Engelskmandens Havn. (P.); Mellemfjord at Kuánit $69^{\circ}44'$ (P.); Mudderbugten $69^{\circ}45'$ (Htz.).

Mainland: Found once at Holsteinsborg $66^{\circ}55'$ (Th. Fr.); Jakobshavn $69^{\circ}13'$ (Sor.), in vain searched for here (P.).

A decided southern type, not common till south of 64° (Ros). Only known from the lowland.

Late flowering, but fructifies at least in warm summers.
Hibernates abundantly covered by snow.

I 223. *Pirola secunda* L. var. **obtusata** TURCZ (= v. *pumila* Cu. & SCHL.; var. *borealis* LANGE).

In the shade under copses and tall herb vegetation, no doubt often overlooked because of its diminutiveness.

Disko: Near Godhavn $69^{\circ}15'$ in several places and gathered by several collectors. Brede Dal $69^{\circ}18'$ (Nygaard!).

Mainland: Præstefjeld near Holsteinsborg $66^{\circ}55'$ (W. & H.; P. & E.).

A decided southern type in Greenland, only known from the mentioned places.

This form, known from sub-arctic America and Asia, but not from Europe, is rather deviating from the main-species, and as its ecological variations in Greenland do not seem to approach the European plant, it had probably better be considered an independent species.

V 224. **Pirola grandiflora** RADIUS (*P. rotundifolia* var. *gr.*
AUTT., var. *pumila* HOOK).

On heath-land, sometimes in thickets and herb-mats.

Very common throughout the whole area.

Widely ranging in West Greenland, with northern limit north of 79°, however becoming scarce south of 64° (Ros.); East Greenland scarce. In Greenland a northern type.

Ranging from the shore as far as dense vegetation is found, not occurring in purely mineralic soil.

Flowers early and fructificates abundantly.

Normally covered with snow during winter.

Not much varying. At the borders of thickets, especially in the southern parts of the area taller specimens with richer inflorescences occur. LANGE has reported a forma *lutescens* with yellowish petals. I am inclined to consider the plants in question only discoloured herbarium specimens. The petals of all live plants seen by us during many years were pinkish, not pure white as in *P. rotundifolia*, nor greenish white.

By several authors considered an arctic form of *P. rotundifolia*, but we think the morphological characters alone sufficient to keep it distinct (see for instance RADIUS: De Pyrola et Chimaphila Lips. 1821—29, WARMING: Bot. Tidsskr. 15 p. 165, ABROMEIT: Bibl. Bot. 42a p. 47 etc.) Its distribution in Greenland shows, that it is of high-arctic, western origin, immigrated to Greenland over Smith' Sound.

The flowers of *Pirola grandiflora* are among the most fragrant in Greenland, the smell recalling that of *Convallaria majalis*.

Pirola rotundifolia L. var. *arenaria* LANGE (an = var. *arenaria* Koch?)

Under this name is several times recorded a plant from Southern Greenland, ranging from 60° to about 69°. I doubt the identity of the plants seen in H. H. with this European form, and I should rather consider them to be forms of the preceding grown in thickets.

I 225. **Pirola grandiflora** × **minor** n. hybr.

Aug. 13, 1913 THORBJØRN PORSILD collected two specimens of *Pirola* near the outflow of the springs in the valley Østerdal on South Disko, 69°15'. He labelled them: "P. *grandiflora*, extraordinarily late flowering", as the said species that year everywhere was in fruiting stage at that date.

Unfortunately I did not see the plants till the winter 1913—14, when the collector had left Greenland, and during the subsequent years I

searched for it in vain on the habitat mentioned. Ordinarily a hybridization between the two species will not easily be effected, because *P. grandiflora* has ceased flowering when *P. minor* begins. But retarded flowers may sometimes be found on spots where the snow has lasted longer than usually.

Although I saw but two specimens I shall mention this probable hybrid here, not only to call the attention of later collectors to it, but also because so very few hybrids of arctic plants are yet known.

Plantae sat graciliores quam P. grandiflorae, etiam aliquantulum minores quam P. minoris specimina ejusdem loci. Folia tenues, non nitescentia, late ovato-elliptica, folia P. minoris similantia. Corolla major quam P. minoris, minor quam P. grandifolia sicut utriusque rosaceo-albida. Petala late orata. Stylus rectus, germine subdupo longior, superne dilatatus. Stigma quinquelobatum.

Most of the above named characters do certainly agree with those of *P. media*, this species being, however, a tall plant of the woods in Europe, not occurring in Greenland. A hybrid between *P. rotundifolia* and *P. minor* has been observed in northern Fennia by KIHLMAN.

XXXIII. Rhodoraceae.

Ledum.

The History of the interpretation of the Greenland *Ledum*-forms (By M. P. P.).

LINNAEUS in his "Species plantarum", 1753 labelled a shrub, common in wooded bogs in Sweden, *Ledum palustre*, before his nomenclature often called *Rosmarinus sylvestris*. The plant was well-known to the Swedish people for its fragrance and it was used as a substitute for hops in brewing or as an insecticide. The name given by LINNAEUS, has been in later literature applied to the same plant from other parts of Europe, and C. FRIS ROTTBOLL determined in 1766 the *Ledum* sent to him from Greenland as *L. palustre L.* (Act. Hafn. X. 1770, p. 441). Although ROTTBOLL's plants do not exist, we may infer from the collectors mentioned by him, that the plants in question belonged to the narrow leaved form (*L. decumbens*).

At the same time another *Ledum* was brought to Europe by several travellers from Greenland, Labrador, New Foundland and various parts af Canada. It was cultivated in most of the leading botanical gardens, and it became soon generally known under its trivial name "Labrador tea" or under the gardener's name "*Ledum latifolium*", being from the first what we now call a *nomen nudum*. The first valid description

is given 1771 by OEDER in "Flora Danica" fasc. X, tab. 567 "*Ledum groenlandicum, staminibus corolla brevioribus, foliis ellipticis. Anglorum Labrador-The.*" The same name was used in 1779 by RETZIUS: "Fl. Scand. Prodr." p. 77 and in 1786 in his "Observationum Botanicarum fasc. IV" p. 26. — In the year 1789 AITON published the II vol. of his "Hortus Kewensis", where he p. 65 describes "the Labrador plant, introduced to Kew 1763", as "*Ledum latifolium, foliis oblongis margine revolutis, subtus tomentosis, floribus subpentandris.*" — Also LAMARCK used the name *L. latifolium* in his "Encyclopédie" of 1789, p. 458—59, as did JACQUIN: "Icones plant. rarior. III", tab. 464, 1786—93, and WILLENDNOW: "Enum. plant. hosti regii Berol.", 1809, p. 450. In the later literature we find the name "*Ledum latifolium*" cited now with AITON, now with LAMARCK, JACQUIN or WILLENDNOW, as authors, and more often the name of RETZIUS is added to *Ledum groenlandicum* than that of OEDER.

A broad-leaved *Ledum* was also detected in Lapland by WAHLENBERG and described 1812 in his "Fl. Lapponica", p. 103 as β *dilatatum*. He doubts the identity of this variety with *L. latifolium* of Willdenow.

AITON also named l. c. a "Dwarf-Ledum", β *decumbens* from Hudson Bay and described it: *spithameum decumbens* in contradistinction to a "*bipedale erectum*."

Of the early American writers MICHAUX "Fl. Bor. Americ. I", p. 259, 1803 only accepted *latifolium* (as a form of *palustre*) and *buxifolium* (= *Leiophyllum*), whereas PURSH 1814, "Fl. Amer. Septentr. I", p. 300 distinguished:

1. *palustre* L.
 β . *decumbens* Ait.
2. *latifolium* Lam. Willd.

To the distinguishing characters between 1 and 2 PURSH adds, quoted from LAMARCK:

1. *palustre*....*staminibus denis corolla longioribus.*
 2. *latifolium*....*staminibus subquinis corollam aequantibus.*
- About *decumbens* nothing new was said.

A valuable contribution to the understanding of this last form was rendered by E. MEYER: "De plantis Labradorieis libri tres", 1830, p. 48—50. MEYER quotes his correspondent HERZBERG, a missionary of the Moravian Brethren and — according to MEYER — a "vir botanicarum controversiarum plane ignarus." About the plant determined by MEYER, to *L. palustre* β *decumbens* Ait., HERZBERG says:

"Der kleine Rosmarin wächst an der Südseite der Berge, wo es trocken ist, und nimmt keine andere Pflanzen unter sich auf. Fangt Mitte Juny an zu treiben und blüht von Mitte July bis Ende August."

About *L. latifolium* Ait. (*L. groenlandicum* Retz.) he says:

"Der grosse Rosmarin, Blüht Mitte August."

In the discussion of the two forms MEYER mentions the broad-leaved varieties of *L. palustre* occurring in Europe (the var. *dilatatum* of WAHLENBERG) "in eadem radice haud raro conjuncta". He doubts the constancy of the length and the number of the stamens of *latifolium*, but nevertheless he considers this plant a valid species, without transitions to *decumbens*, and besides the differences given by HERZBERG, MEYER, adds:

	<i>L. latifolium</i>	<i>L. palustre decumbens</i>
<i>stylus:</i>	leviter flexus	omnino rectus
<i>puncta auronitentia in</i>		
<i>bracteis:</i>	copiosissima	rarissima
<i>gemmae bractearum:</i>	obtusissimae et fere semiglobosae	multo tenuiores ma- gisque attenuatae

During his 8 years of indefatigable investigations of the flora of Greenland JENS VAHL made clear the main points concerning the Greenland *Ledum* forms and their distribution. In his labels he determined them respectively 1) *L. groenlandicum* and 2) *L. palustre* β *decumbens*. As to the occurring of the European form he demonstrates his doubt by labelling the plants "*L. palustre L.?*" "ad α accedens", or the like.

In his "Conspectus Florae Groenlandiae" 1880 JOH. LANGE enumerates:

L. palustre L.

α . *vulgare*. *Erectum, parum ramosum, foliis lanceolato-linearibus.*

β . *decumbens* AIT. *Trunco humili, subdepresso, saepius crebre ramoso, foliis anguste linearibus, gemmis florigeris oroideis.*

L. groenlandicum OED. *Folia elliptica-ovalia, basi subcordata, pagina superiore dense rugoso-areolata, gemmae florigerae globosae. Flores saepe pentandri (teste HOOKER).*

LANGE states α to be rare in Greenland. Further he doubts the specific rank of *L. groenlandicum*, having seen specimens that according to the form of the leaves might as well be determined as belonging to one or another of the species. Previous to the statement of LANGE, HOOKER had stated the same opinion in his "Flora Boreali-American" 1840. in which II. p. 44 for the same reasons he reduced *latifolium* to a variety of *palustre*. And when ROSENVINGE in 1892

published his "Andet Tillæg" to LANGE he further reduced *groenlandicum* to a variety coordinate with *decumbens* and *palustre* α, cp. p. 691.

The reduction of *L. groenlandicum* to a variety is, however, in direct opposition to the view of modern American florists and taxonomists. Having the profoundest knowledge of the plant from their researches in nature, they without any exception classify it as a separate species. And, we may add, as all modern dendrologists do, also in Europe where the plant still everywhere preserves its different aspect under cultivation; (see for instance C. K. SCHNEIDER: "Illustr. Handb. der Laubholzkunde" II, 1912 p. 469). As will be seen by our investigations we cannot but support this view.

Regarding the other *Ledum* in Greenland I (i. e. M. P. P.) cannot see but one taxonomic unit in it. I must confess that its variations on favourable habitats tend to develop larger leaves, but on the other hand I never found plants like typical specimens of *L. palustre* from Northern Europe. There always remains a certain characteristic habit giving it a different appearance. And as the geographical features seemed to support my view of *L. decumbens* as specific distinct from *L. palustre*, a closer investigation of a large material became desirable. As our home in Greenland is situated far to the north of the area of *L. groenlandicum* and as our material of herbal specimens of this species and still more of *L. palustre*, was too scanty, we applied to the Trustees of the Botanical Museum at Copenhagen and obtained a large material. As form and size of the leaves hitherto yielded the most conspicuous distinguishing characters, an investigation of those points was chosen as our main object, the more so because time was scarce, the printing of our M. S. had been begun. This investigation was carried out by E. P. alone.

The distinguishing characters of *Ledum palustre*, *L. decumbens* and *L. groenlandicum*. (By A. E. P.)

In order to ascertain the size and form of the leaves of *Ledum* I investigated the material preserved in the herbariums of the Arctic Station in Greenland and of the Botanical Museum at Copenhagen. For the great majority of specimens I took the determinations, as they were left by the several collectors, only of a slight number of specimens have I altered the determinations, after having found a new distinguishing character (see below). For the investigation a well developed year's shoot of every specimen was taken and the leaves were measured: the length without the petiole, the breadth without the

revolute margins. The lowest and the topmost leaves, ordinarily somewhat smaller than the rest, were not taken into consideration. On shoots with a sufficient number of leaves, 10 were measured, otherwise a smaller number. In all 923 leaves of 135 specimens were investigated.

In the following lists I—V, marks

- N the number of leaves measured,
- L the length in millimetres,
- b the breadth in millimetres,
- l/b the ratio between length and breadth, i. e., the shape of the leaves.

The lists are arranged after the ratios, beginning with the broadest and ending with the narrowest leaves.

I. *Ledum decumbens*.

West-Greenland, 63° — 70° Lat. N.

	N	L	b	l/b
Kangerdluarssuk $72^{\circ}38'$, Ryder	7	11,9	3,1	3,84
Qeqertalik $66^{\circ}44'$, Brummerstedt.....	6	13,5	3,0	4,50
Nákjanga..... $66^{\circ}50'$, J. A. D. Jensen	6	8,7	1,9	4,58
Qeqertarssuaq.. $72^{\circ}53'$, Ryder	5	7,5	1,6	4,69
Godhavn $69^{\circ}15'$, R. Brown	5	13,2	2,7	4,78
Holsteinsborg .. $66^{\circ}56'$, Lundager.....	6	11,1	2,3	4,83
Nunatarssuaq .. $64^{\circ}30'$, J. Vahl	7	9,1	1,6	5,69
Holsteinsborg .. $66^{\circ}56'$, Deichmann.....	6	9,8	1,7	5,77
Pâkitsoq..... $69^{\circ}27'$, J. Vahl.....	6	11,0	1,9	5,92
Diskofjord..... $69^{\circ}27'$, M. P. Porsild	10	13,8	2,3	6,00
Kangerdluarssuk $67^{\circ}58'$, E. Porsild	10	10,4	1,7	6,02
Diskofjord..... $69^{\circ}29'$, M. P. Porsild	10	16,0	2,3	6,09
Uvkusigssat ... $72^{\circ}18'$, K. J. V. Steenstrup	6	11,8	1,3	6,21
Isortoq..... $67^{\circ}10'$, J. Vahl.....	7	13,1	2,1	6,24
Laksefjord..... $72^{\circ}31'$, Th. & M. P. Porsild	10	14,6	2,3	6,27
Skansen..... $69^{\circ}25'$, M. P. Porsild	10	11,7	1,8	6,36
Ikertôq $66^{\circ}45'$, J. Vahl.....	7	13,0	2,0	6,50
Jakobshavn.... $69^{\circ}13'$, Engell	6	13,2	2,0	6,60
Holsteinsborg .. $66^{\circ}56'$, J. Vahl	5	13,5	2,0	6,75
Akúnâq..... $68^{\circ}48'$, M. P. Porsild	10	10,3	1,5	6,75
Godthaab $64^{\circ}11'$, J. Vahl	7	17,0	2,5	6,80
Torssukátak ... $69^{\circ}55'$, Sylow.....	7	13,4	1,9	7,02
Umánatsiaq ... $70^{\circ}35'$, J. Vahl.....	7	12,0	1,7	7,06

		N	L	b	1/b
Godthaab	64°11', Rosenvinge	6	11,7	1,6	7,31
Laksefjord	72°30', Th. & M. P. Porsild	10	20,6	2,8	7,42
Laksefjord	72°30', Th. & M. P. Porsild	6	15,0	2,0	7,50
Ungôriarfik	67°42', A. Kornerup	6	11,0	1,5	7,50
Godthaab	64°11', Rosenvinge	7	10,9	1,4	7,79
Jakobshavn	69°13', J. Vahl	5	10,3	1,3	7,92
Qarajaq	70°30', Vanhoffen	7	12,0	1,5	8,00
Bjornesund	63°0', Kornerup	6	17,7	2,2	8,05
Sermilik	65°33', S. Hansen	8	13,3	1,6	8,31
Christianshaab .	68°49', Warming & Holm .	6	10,4	1,2	8,67
Qugssuk	64°32', Holboll	10	10,5	1,2	8,75
Christianshaab .	68°33', M. Mathiesen	6	13,0	1,4	9,30
Umánaq	70°40', Lundager	6	16,1	1,7	9,47
Ikertôq	66°58', E. & M. P. Porsild.	10	11,3	1,1	10,00
Sermerssuit	65°35', Warming & Holm .	5	13,5	1,3	10,00
Diskofjord	69°35', M. P. Porsild	10	16,6	1,6	10,54
Laksefjord	72°03', Th. & M. P. Porsild	10	13,1	1,3	10,69
Average of 290 measurements on 40 specimens:			12,79	1,85	6,91

II. *Ledum decumbens*.

Arctic America and Siberia.

		N	L	b	1/b
Arct. America, Lyon Inlet, Parry		6	9,1	1,8	5,06
Siberia, Pitlekaj, Kjellman		6	8,4	1,3	6,46
Labrador, Hopedale, R. F. Hohenacker . . .		8	14,5	2,2	6,60
Aret. America, King Point, G. Hansen		6	12,3	1,8	6,83
Siberia, St. Lawrence Bay, Kjellman		5	9,2	1,3	7,07
Siberia, Boganida, Middendorff		8	14,7	2,0	7,35
Aret. America, Hudson Bay, J. M. Macoun .		6	15,3	1,9	7,85
Labrador, Turnavik, J. M. Macoun		6	14,4	1,8	8,00
Labrador, Rigolet, Geol. Survey		5	15,6	1,7	9,18
Siberia, Kamschatka, Rieder		5	19,5	1,8	10,82
Siberia, Amur Land, F. Karo (Determination doubtful)		7	24,0	1,8	13,33
Average of 68 measurements on 11 specimens			14,41	1,80	8,03

III. *Ledum groenlandicum*.

South Greenland.

		N	L	b	1 b
Umánaq	64° 29', S. Hansen	5	16,5	10,6	1,56
Sermersoq	60° 27', A. Jensen	5	11,8	6,8	1,73
Kuánersôq	62° N. Hartz	10	13,6	6,8	2,00
Julianehaab	60° 43', G. Meldorf	10	15,4	7,2	2,14
Timingnertôq	62° 20', Kornerup	5	13,4	5,9	2,24
Neriaq	61° 35', N. Hartz	5	18,5	8,2	2,26
Kobbefjord	64° 08', Warming & Holm	7	22,2	9,8	2,30
Nunatarssuaq	64° 30', J. Vahl	10	13,0	5,6	2,32
Nunarssunguaq	64° 30', J. Vahl	5	24,7	10,3	2,40
Ivigtût	61° 13', G. Meldorf	10	14,6	5,9	2,47
Ivigtût	61° 12', Lindhard	10	14,0	5,6	2,49
Sermilik	65° 33', S. Hansen	6	32,5	12,9	2,52
East Grd. Chr.					
4. O	60° 00', Sylow	10	19,4	7,6	2,53
Hua	59° 55', Sylow	7	20,7	8,0	2,59
Julianehaab	60° 43', G. Meldorf	10	18,4	6,9	2,67
Qeqertalik	66° 44', E. & P. M. Porsild	10	25,5	9,5	2,70
Kobbefjord	64° 08', Warming & Holm	7	10,6	3,9	2,70
Ivigtût	61° 13', Lindhard	10	14,4	5,2	2,70
Kapisilik	64° 26', J. Vahl	10	22,0	8,1	2,72
Godthaab Fjord	64° 25', Nygaard	10	24,1	8,7	2,77
Greenland	Hb. Hornemann	5	26,6	9,6	2,78
Kuánersôq	ca. 62° N. Hartz	10	20,5	7,1	2,89
Greenland	Giesecke	5	30,9	10,4	2,98
(?)Egedesminde(?)	68° 42', H. P. Sørensen	5	17,2	5,7	3,02
Kuánersôq	ca. 62° N. Hartz	10	16,1	5,3	3,04
Baals Revier	64° 30', J. Vahl	5	32,4	10,0	3,24
Tasermiut	60° 5' J. Vahl	7	15,9	4,9	3,25
Greenland	, Wormskjold	5	19,0	5,7	3,33
Godthaab Fjord	64° 20', Nygaard	10	18,5	5,5	3,36
Nunarssunguaq	64° 30', J. Vahl	7	26,3	7,8	3,37
Ikertôq Fjord	66° 45', E. & M. P. Porsild	10	17,6	5,6	3,44
Greenland	Hb. M. Vahl	5	19,0	5,1	3,73
Holsteinsborg	66° 56', Lundager	10	17,2	4,4	3,91
Qugssuk	64° 32', Holboll	6	20,0	4,8	4,17
Holsteinsborg	66° 56', N. Hartz	10	24,1	5,6	4,30
Ikertôq	66° 58', E. M. & P. Porsild	10	20,8	4,8	4,33
Baals Revier	64° 30', J. Vahl	5	25,7	5,5	4,67
Ikertôq	66° 45', J. Vahl	5	26,4	5,2	5,08

		N	L	b	b 1
Qugssuk	64°32', J. Vahl,	6	19,0	3,3	5,76
Greenland	J. Vahl,	10	21,3	3,0	7,10
Average of 308 measurements on 40 specimens			20,01	6,31	3,18

IV. *Ledum groenlandicum.*

Boreal America.

		N	L	b	1 b
Canada, Quebec, Mt. Albert, M. L. Fernald		5	14,9	7,4	2,01
New Foundland, St. Johns, Robinson & Schrenk		6	26,2	11,8	2,22
U. S. A., Maine, Langerville, M. L. Fernald		5	23,4	8,0	2,93
— — St. Francis, — — —		5	28,0	8,6	3,26
[cultivated] Hort. Bot. Jenensis		6	28,3	8,5	3,33
Labrador, Rigolet, Geol. Survey		10	34,7	10,1	3,44
Alaska, Juneau		5	29,6	7,9	3,75
Labrador, Battle Harbor, Geol. Survey		8	23,5	6,0	3,92
Average of 50 measurements on 8 specimens:			27,77	8,83	3,14

V. *Ledum palustre.*

Boreal Europa.

		N	L	b	1 b
Sweden, Jönköping, Mortensen		5	23,6	4,8	4,92
Lapland, Orlow, Kihlman		5	13,8	2,8	4,93
— Lulea, Duurloo		8	20,6	3,8	5,42
— Bösekop, Warming		5	24,6	4,5	5,47
Germany, Lauenburg, J. Lange		5	34,0	6,0	5,80
Lapland, Bösekop, Warming		6	18,8	3,0	6,27
— Mortensnæs, Nordvi		6	20,3	3,0	6,77
Germany, Brandenburg, Paukert		6	24,1	3,5	6,89
Sweden, Öland, Ostenfeld		5	36,8	5,0	7,36
— Västergötland, Almquist		5	29,6	3,9	7,59
Russia, St. Newski, Koernicke		5	14,9	1,9	7,84
Germany, Brandenburg, A. Lange		6	25,1	3,1	8,10
Sweden, Östergötland, J. Lange		5	30,4	3,7	8,22
— Värmland, Liebmann		5	39,0	4,7	8,30
Finland, Tavastia, Collin		5	37,4	4,5	8,31
Germany, Silesia, Ziesche		5	44,8	5,3	8,45

	N	L	b	b l
Poland, Niosikop	5	18,1	2,1	8,62
Sweden, Västervik, Liebmann	5	32,0	3,7	8,65
Lapland, Lulea, Deinboll	6	30,0	3,4	8,82
Finland, Abo, Holmén	10	33,7	3,8	8,87
Poland, Debeltovo, Raciborski	5	19,0	2,1	9,05
Lapland, Bösekop, Warming	6	19,9	2,2	9,07
— — — — — Hartman	6	19,6	2,1	9,33
Sakkabani, Warming	6	20,0	2,1	9,52
Letland, Riga, Buhse	6	31,0	3,2	9,67
Germany, Brandenburg, A. Lange	6	28,5	2,9	9,83
— J. Lange	5	20,0	1,9	10,52
Austria inferior, Spritzenhofer	5	26,6	2,5	10,64
East Prussia, v. Duisburg	5	43,0	3,7	11,62
Finland, Nyland	6	37,0	3,1	11,93
Sweden, Hartman	5	35,2	2,8	12,57
Russia, White Sea Island, Pohle	10	23,3	1,6	14,56
Average of 184 measurements on 32 specimens:	27,20	3,24	8,41	

Results of the investigations.

Summarizing the results of the measurements listed above, we find:

I.	<i>L. decumbens</i> , Greenland 40 specimens, 290 measurements	1	b	1 b
		7—12,79	—21	1—1,85—3
II.	<i>L. decumbens</i> , Arctic America and Siberia 11 specimens, 68 measurements	14,41	1,80	8,03
III.	<i>L. groenlandicum</i> , South Greenland 40 specimens, 308 measurements	11—20,04—35	3—6,31—13	1,5—3,18—7
IV.	<i>L. groenlandicum</i> , Boreal America, 8 specimens, 50 measurements	27,77	8,83	3,14
V.	<i>L. palustre</i> , Boreal Europe 32 specimens, 184 measurements	15—27,30—45	1,5—3,24—6	5—8,41—15

By comparing the lists I and III we see that the two Greenland species of *Ledum* in the great majority of cases will easily be distinguished by the shape of the leaves alone, *L. groenlandicum* being — as was known before — a more broad-leaved form. However, we must admit that in some cases the lists overlap, i. e. there

exist some rather narrow-leaved specimens of *L. groenlandicum* and some broad-leaved ones of *L. decumbens*. In those cases, however, the absolute size of the leaves will be decisive as *L. groenlandicum* is moreover a more large-leaved form.

By comparing the lists I and II we see that the scanty material of *L. decumbens* from Arctic America and Siberia agrees very well with the large one investigated from Greenland. The size and the shape of the leaves are nearly the same. And by comparing the lists III and IV, it will be seen that *L. groenlandicum* from Boreal America has somewhat larger leaves than the Greenland specimens, but the shape is the same. The American plants belong to the same stock, but where growing under more favourable circumstances, they are better developed.

The next question is: Can the plant here called *L. decumbens* by the size and shape of the leaves be distinguished from *L. palustre* of Boreal Europe? By comparing the lists I and II with V we see, that as to the size there is a wide difference: the leaves of *L. palustre* are on an average twice as long as those of *L. decumbens*. As to shape there seems to be a slight difference too: the leaves of *L. palustre* are also relatively somewhat longer than those of *L. decumbens*, (Comp. I and V). But as the leaves of plants ranging from boreal zones into the arctic ordinarily become smaller, the size of the leaves alone would hardly suffice to establish an independent species.

According to our experience gleaned from the various parts of West Greenland, *L. decumbens* also varies, according to the conditions of the habitat, developing rather large leaves in favourable situations. Numerous examples will be found in the list I. And, on the other hand, it will be evident from examples in the list V that also *L. palustre*, under unfavourable conditions, varies inversely, leaves growing smaller. However, even under extreme conditions, the two species will retain a certain habit of their own, hardly to be described. After having closed my investigation of the whole material I should easily at a glance be able to match the different mounted specimens of *L. decumbens* and *L. palustre* without reading their labels.

What is f. *dilatata* Wahl?

In his *Flora Lapponica* WAHLENBERG mentions under *Ledum palustre* a β *dilatatum*: "foliis oblongo-ovalibus." Of this form I have seen the following specimens:

	N	I	b	1/b
Sweden, Falun, Hartman	6	27	7.6	3.55
Japan, Nippon, Tchechonoski	5	27.5	6.0	4.58
Lapland, Karesuando, Lästadius	6	40.0	5.8	6.90

The specimen of LÄSTADII'S was, as seen by the label, sent to some correspondent at Copenhagen to have it compared with *L. groenlandicum*. It does not indeed, belong to this species. It seems to me — as it seemed to LÄSTADII'S, according to remarks on his label — a mere ecological form, occurring now and then, and hardly inheritable.

Also from America a *L. palustre* var. *dilatata* Wahl. is mentioned in literature. I have not seen this plant. Having not seen any genuine *L. palustre* from America, but only *L. decumbens*, I doubt the occurrence of the former species in America, and the American var. *dilatata* would thus have to be considered an analogous ecological form of *L. decumbens*.

Another form seen in the Herb. Haun. is var. *longifolia* Freyn, collected in Amur Land, Siberia by Karo. A measurement of 6 leaves gave

I: 43.7; **b:** 3.5; **1 b:** 12.48.

Also this form will hardly be constant, and some of the specimens listed in V might just as well be called *longifolia*.

A new distinguishing character for *L. decumbens*.

As is well-known, the inflorescences of *Ledum* are terminal umbel-like clusters and the capsules are 5 celled, dehiscent from the base. In accordance with this fact, the capsules during ripening are downwards bent. There are some differences between the species in the number of flowers, *L. palustre* having the richest, *L. decumbens* the poorest inflorescences. Also the size of the flowers and capsules is largest in *L. palustre*, slightly smaller in *L. groenlandicum* and considerably smaller in *L. decumbens*. But most characteristic is the curvature in the peduncles of the ripe or hibernated capsules. In *L. groenlandicum* the curvature is even through the whole length of the peduncle. In *L. palustre* the curvature is nearly the same, the basal part of the peduncle being, however, often somewhat straightish. But in *L. decumbens* the peduncle itself is not curved or only very slightly, whereas the capsule is abruptly downwards bent at the very top of the peduncle, also seen by ABROMEIT, p. 59. This difference in the curvature gives the whole inflorescence in the fruiting state a very conspicuous appearance.

Perhaps it might be objected that this curvature of the peduncles would be dependent on climatic conditions and therefore of no more distinguishing value than the small leaves etc. of *L. decumbens*. One might probably think that the shortness of the arctic summer would not permit an even curving of the peduncle whilst its tissues are yet unsclerified and that the abrupt bending of the capsule is due to the abrupt setting-in of the frosts in fall. But against that objection it

may be urged, that 1) this character marks all fruiting specimens seen from Greenland, also those growing 4 degrees of latitude south of the northern limit of *L. groenlandicum*; 2) that I did not find it on any specimen of *L. palustre* from unfavourable habitats; and 3) that specimens of *L. groenlandicum*, whose genuineness was proved by other characters, growing with *L. decumbens* near the northern limit of *L. groenlandicum* showed no tendencies to such an abrupt hooking of the peduncles.

The morphologically basal part of the capsule-valves of *L. palustre* are distinctly outwardly bent. In *L. groenlandicum* no such thing is seen, the outer surface of the valves being symmetrical. In *L. decumbens* the basal parts of the valves are often outwardly curved, but only very slightly or indistinctly.

The distinguishing characters of the 3 species as found by various authors may be summarized as given in the following page.

The Geographical Distribution. (By M. P. P.)

The main points of the distribution of the *Ledum*-species in Greenland was already known to JENS VAHL, and have since been elucidated by LANGE and ROSENVINGE and I have not much to add.

! 226. *Ledum decumbens* (Ait.) E. & M. P. PORSILD nov. comb.

On heath, often on very dry forms of heath, as for instance on tertiary sands. Sometimes in not too moist mossy bogs.

Disko: Common in the gneissic part. Also common in the sandy area on the south coast, here almost exclusively forming the heath. Ascending to at least 700 m. On basaltic ground covered by old and dense vegetation often common, but not occurring in fresh morainic soil. Besides there are, however, rather wide areas of the island especially on its northern and western part, where one may walk for miles without seeing the plant. (P.).

Hare Ø: Occurring, but scarce (P.).

Mainland: On the basaltic part of Nügssuaq peninsula sporadic like on Disko. On the gneissic part from Torsukátab soutwards, however, continually distributed and common everywhere. In the southern part of the area commoner on the outer coast and on the hills, whilst the more favourable localities in the lowland are mostly occupied by the following species.

According to ROSENVINGE very rare south of 64°, but seen by him down to 61°. In the Herb. Haun. we saw no specimens south of 63°. The northern limit in West Greenland is still unknown, but is to be found somewhere north of 74°. Hence a northern type.

Summary of distinguishing characters, stated by various authors.

	<i>Ledum palustre</i> .	<i>Ledum decumbens</i>	<i>Ledum groenlandicum</i> .
Growth-form	a small, erect, not much branched shrub, up to 1 m linear	a decumbent, much branched shrub, up to 0.5 m	an erect, not much branched shrub up to 1 m.
leaves' form	length of leaves, mm	narrow linear	oblong
breadth of leaves, mm	l. b. Average	15—25—45	11—20—35
upper surface of leaves	breadth of leaves, mm	1.5 3 6	3—6—13
floral buds	l. b. Average	8 9	2—3
calyx-teeth	upper surface of leaves	mostly smooth	coarsely areolate wrinkled
stamens	floral buds	ovoid	subglobose
length of stamens	calyx-teeth	rather long ciliate	short or indistinctly ciliate
size of capsule, mm	stamens	mostly 10	5—7
form of capsule	length of stamens	longer than corolla	like the corolla
style of ripe capsule	size of capsule, mm	2.5—3.5 \times 6—7	3—4 \times 4—5
base of ripe capsule-valves	form of capsule	ovoid or subglobose; distinctly curved	ellipsoid or subcylindric
peduncle of ripe capsules.	style of ripe capsule	thin; as long as the capsule	thin, distinctly longer than
climate of occurrence	base of ripe capsule-valves	thick, often shorter than capsule	thin, distinctly longer than capsule
geographical range	peduncle of ripe capsules.	distinctly recurved from a straightish base	not recurved
		abruptly bent under the capsule, otherwise nearly straight	evenly arcuated through their whole length
		arctic or alpine, also near the coast	boreal, lowland
		N. America	N. America, South Greenland
		Northern Eurasia, ? Western	
		Eastern Arctic Asia, Arctic	
		N. America, W. Greenland	

Abundantly flowering, but the fructification is not good every year.
Covered by snow during winter.

A 227. **Ledum groenlandicum.** OED.

On luxuriant not too dry heath, in mossy bogs and at the edges
of willow thickets.

Mainland: Near Holsteinsborg, 67° , and in the fjords inland from that place
rather common (several collectors).

It has sometimes been reported farther to the north on the mainland and also
sometimes from the fjords of Disko. But although we have eagerly searched for it,
we never succeeded in finding it here. In the Herb. Haun, is a specimen from Egedes-
minde $68^{\circ}42'$ (Sør.) (see list III), but we doubt the correctness of the statement.
We must, until new records have been made, consider the polar circle as its northern
limit in West Greenland.

South of our area it becomes commoner, and it occurs down to the
southmost Greenland and reaches to at least $60^{\circ}10'$ on the east coast.
Hence a southern type.

Principally a lowland plant. Abundantly flowering and — in the
southmost habitats — also abundantly fructifying.

Covered by thick layers of snow during winter.

With the slight exception mentioned above no *Ledum* occurs on
the whole coast of East Greenland.

Outside Greenland no *Ledum* is known, neither from Iceland,
Jan Mayen, Færöes nor the British Islands. In northern Norway and
through the whole of Sweden occurs *L. palustre*. This species is sporadic
in the lowland of Germany becoming commoner eastwards, rather con-
tinually distributed from Servia through Hungary, Austria, Galicia, Po-
land, eastern Baltic lands, Fennia to Lapland. Further it is common in
temperate and boreal Russia and through the whole of northern Asia
to Korea and northern Japan. In its whole area this species is a low-
land plant and a continental species avoiding the arctic barrens north
of the limit of the forests. Perhaps it enters the American continent in
its western boreal part. What we saw from Arctic and Eastern North
America belonged to *L. decumbens*.

L. decumbens occupies the Arctic part of Asia, at least to Jenissei.
It has sometimes been reported from Arctic Russia and the Kola penin-
sula. What we saw from the northernmost localities of Europe was
depauperate forms of the preceding. On Nova Zemlia and Spitsbergen
no species of *Ledum* occurs. Further we consider the *Ledum* occurring in
Northern America north of the area of *L. groenlandicum* to be this species.
It ranges in the eastern part nearly up to the 70^{th} parallel of latitude

and southwards to New Foundland. By ROBINSON & FERNALD a variety *dilatatum* is stated down to the Mountains of Maine and to the Great Lakes. If we are right, that would be a luxuriant form of *L. decumbens*.

L. groenlandicum is a lowland plant ranging through the Boreal parts of the whole North American continent, the American analogon to the Eurasian *L. palustre*. Besides Southern Greenland it perhaps also enters the Boreal Northwestern parts of Asia (according to ELDEBOUR).

To Greenland the species of *Ledum* immigrated in postglacial time. *L. decumbens* probably came from the North, over Smith Sound. Its area in West Greenland is now widely separated from its main distribution in Arctic America, and therefore the immigration probably took place during the milder climate of an interglacial period. A much larger gap separates the Greenland stock of *L. groenlandicum* from its continental American area. It is one of the numerous representatives of the Boreal American Forest-Flora occurring in Southern Greenland, the immigration of which to Greenland is still totally enigmatic.

i 228. **Rhododendron lapponicum** (L.) WAHL.

In rather dry heath and on rock shelves.

Very common throughout the whole area.

Widely distributed in Greenland, without southern limit, in the southern parts however scarcer (Ros.); the northern limit not known, but is to be searched for north of 76°.

Ranging from the shore line to considerable altitudes.

Early flowering and abundantly fructificating.

Not much varying; ordinarily prostrate, in the southern parts in sheltered positions forms like erect shrubs or dwarf trees occur.

Covered by snow during winter, but not by thick layers.

i 229. **Loiseleuria procumbens** (L.) DESV.

On sunny spots in heath, on cliffs, sometimes on fell-fields.

Common throughout the gneissic parts, scarce on basalt, often absent over wide areas here. (Comp. *Ledum*.)

Widely distributed in West Greenland without southern limit; the northern limit still unknown, in East Greenland not north of 67°16'.

Ascends to great altitudes.

Abundantly flowering and fruiting.

Normally covered by snow during winter.

i 230. **Phyllodoce coerulea** (L.) BAB. *Bryanthus taxifolius* Gray).

In herb-mats and luxuriant sheltered heath.

Disko: Common on the south coast and in Diskofjord as well as on the northern shore of Mellemfjord. Also occurring north of Nordfjord, but scarce. Not observed on the Waygat-coast, nor in the big valleys leading to the heads of the northernmost fjords (P.).

Mainland: Rather scarce and restricted to favourable spots in the northern parts, becoming commoner southwards and at greater distance from the shore (P.).

Widely distributed in West Greenland, without southern limit; the northern limit somewhere north of 74° .

In the area mostly a lowland plant.

Abundantly flowering and fructificating.

Covered by thick layers of snow, often occurring on spots with long lasting snow-patches.

XXXIV. Ericaceae.

V 231. **Cassiope tetragona** (L.) Don.

In heath and not too wet bogs. Also in fell-fields up to the borders of the snow fields.

Very common throughout the whole area.

Widely distributed in West Greenland without northern limit.

The southern limit is about 64° where the plant only occurs in alpine inland stations. Already in the fjords between 66° — 67° scarcer on the sunny slopes than on the northern; observed, however, locally down to the shore. A northern type.

Flowers and fructificates abundantly, the fruits ripen under the snow; and the seeds are not dispersed till the following spring.

This heather attains its most vigorous growth on sunny, well drained spots with abundant watering during the vegetative season. Next to *Empetrum* the most characterizing shrub in the heath. Like this it is collected in large quantities for fuel. Owing to its highly resinous contents it will burn in flames, even in a wet state.

Normally covered by thick layers of snow, in the highlands sometimes also snowless.

i 232. **Harrimanella hypnoides** (L.) COVILLE. Proc. Wash. Ac.

Sc. III. 1901. p. 575 (*Cassiope hypnoides* (L.) Don.).

On spots with long lasting snow, nearly always together with *Salix herbacea*.

Common throughout the whole area. In the big fjords of the southern part, however, rather scarce in the lowland, commoner on elevated stations or on the northern slopes.

Widely distributed throughout the whole area, without southern limit; the northern limit not yet known, but will be north of 74°.

Abundantly flowering and fructifying.

Covered by thick layers of snow during winter.

Andromeda polifolia L. was reported from Disko by TAYLOR and HAAR, but according to SIMMONS (Medd. om Gr. 26, p. 472) no plants verify these statements. Otherwise in Greenland only observed once somewhat north of 62°.

L 233. *Arctostaphylos Uva Ursi* (L.) SPRENG.

On luxuriant and sunny spots in the heath.

Mainland: Only observed in the fjords inland from Holsteinsborg: Maligiaq and Itivneq, about 67° (V., W. & H. P. & E.), Ikertöq, 66° 47' (V.), Aussivik at the head of Itivdeq-fjord, 66° 31' (P. & E.).

A distinct southern type, otherwise not known from Greenland.

The specimens are very stout, abundantly flowering and fructifying.

Covered by snow in winter.

A 234. *Arctostaphylos alpina* (L.) SPRENG.

In small isolated patches amongst other Ericaceae in the heath. Rare.

Disko: A small occurrence, only a few meters in diameter near the village Sioraq in Disko-Fjord, 69° 28', well known by the natives who present it as a curiosity to travellers. For the first time brought home by L. KUMLIEN, later by TRAUSTEDT, SORENSEN and PORSILD (several times). A similar patch east of the cliff Skansen (Ivnarssuit) 69° 20' on the south coast, even here detected by the natives (P.).

Mainland: On the islet Qeqertaq at Torssukáatak icefjord, ca. 70°, detected by BERGGREN, refound by E. P.

In West Greenland a rare southern type although it ranges farther north in other countries. South of our area only found a few times about 65°. Also occurring in the Scoresby-Sound region in East Greenland.

Abundantly flowering and fructifying. The berries are black, when ripe.

Covered by snow during winter.

XXXV. Vacciniaceae.

I 235. *Myrtillus uliginosa* (L.) DREJ. var. *microphylla* LANGE.

On heath-land, cliffs and barrens.

Very common throughout the area.

The widest distributed shrub in Greenland, horizontally as well as vertically, without southern or northern limits.

Abundantly flowering and fructificating.

Often snow-less during winter.

Locally, on favourable spots, especially on sunny rock-ledges or in clefts with sufficient moisture in summer, a stouter, tall-leaved form: var. *pubescens* (HORN) LANGE occurs. It is always covered by thick layers of snow in winter and late flowering, whereas var. *microphyllum* is early flowering (Conf. PORSILD: Medd. om Grønl. 50. p. 381 fig. 14 and p. 362 fig. 9). Perhaps there is a certain connection between the late flowering and the snow covering. Another direct effect may be that this form, at least in the northern parts of the area, but seldom or never fructificates.

The berries of var. *microphylla* are very juicy and palatable and are much coveted by Europeans in Greenland. Also the natives do collect and eat them, but not to the same extent as those of *Empetrum*, principally because they ripen before the frosts set in and are impossible to keep in the natural state.

A 236. *Vaccinium Vitis Idaea* L. var. *minus* LODD. (Syn. v. *pumilum* HORN).

On luxuriant heath and not too wet mossbogs.

Disko: Very rare, near Godhavn, 69°15', on a single spot, hardly 10 m in diameter between Lyngmarken and Osterdal (E. P.). "Disko", special locality not mentioned, found by Margrete Krarup Smith, perhaps from the same spot. South coast at Igpiq, 69°18' and Kùgssuaq, 69°20', on both places only a few specimens (P.). — Diskofjord, according to the natives the plant is said to grow somewhere near the mouth of the fjord, but nobody knows the locality now.

Mainland: Jakobshavn, 69°13' (Pfaff.). South of the Icefjord rather common, especially in the Sydostbugt (P.). Also common on the islands around and south of Egedesminde as well as in the fjords on those latitudes (P.). Very common in Nordre Strømfjord and in the fjords inland from Holsteinsborg (P. & E.).

A southern type principally occurring in the middle parts of the west coast. In the southernmost parts of Greenland the occurrences are scarce. North of our area the plant has several times been reported in the literature, right to 76°, but all the reports want confirming and until then Disko has to be considered the northern limit.

The var. *minus* Lodd. is at the same time a western type, widely

ranging in North America and Eastern Greenland. On Iceland the European form occurs.

Flowers abundantly. The occurrence at Godhavn has been carefully observed through half a dozen years, but it never fruited. About the Sydostbugt great quantities of berries are, as a rule, collected every year for sale to European households around Disko Bay. The fruits are, however, sometimes so scarce that it does not pay to collect them. Thus principally after winters rich in snow and cold springs. About Egedesminde the berries do ripen, but not in such quantities that it will pay to collect them. Around Iginiarfik in the Ataneq-fjord, 68° 70' berries are collected every year for local demand, and more could easily be supplied if the conditions of transport to other places were better. The natives do not collect the berries for themselves as they cannot afford the extra sugar which is needed to make them palatable. By Danish housekeepers the berries are considered much better than introduced Danish or Norwegian berries.

Oxycoccus palustris PERS.

was reported from Hunde Ejland, 68° 52' (Sør.) and the specimen exists in H. H. Otherwise the plant is found several times between 60° and 62° and from the Godthaab-fjord-region, 64°. On Hunde Ejland it has been searched for several times, by KREUSE as well as by us, but in vain, and as the island is but small and the suitable localities easily surveyed, we are inclined to suppose that the statement is due to confusing of material.

XXXVI. Diapensiaceae.

I 237. *Diapensia lapponica* L.

On open sunny spots in heath and barrens.

Disko: Common in the gneissic parts, scarce in the basaltic and absent in the northern parts of the island, also in the luxuriant valleys leading into the interior.

Mainland: Common on gneissic rock throughout the area, however, scarcer in the lowland around the big fjords of the southern part.

Widely distributed in West Greenland, without southern limit, the northern limit is still unknown, but may be searched for north of 74°.

Ascending to high altitudes.

Abundantly flowering and fructificating.

Normally covered by snow during winter, but sometimes snowbare tufts are found.

XXXVII. Plumbaginaceae.

I 238. *Statice maritima* (L.) MILL. var. *sibirica* (TURCZ.) SIMM.

On heath and barrens, lake shores and sometimes near the sea.

Disko: Common everywhere up to at least 800 m.
Hare Ø (P.).

Mainland: Around Disko Bay common; archipelago around Egedesminde scarce (K. P. & E.) Nordre Stromfjord scarce, principally on the northern slopes and on the hills (P. & E.); in the fjords inland from Holsteinsborg not common (P. & E.).

Widely distributed in West Greenland without northern or southern limit.

Often occurring near the brackish water, but is not restricted to the sea shore.

Abundantly flowering and fructificating.

Normally covered by snow during winter.

XXXVIII. Primulaceae.

A 239. *Primula mistassinica* MICHX.

On saline meadows and raised marine clays.

Mainland: Atå at the Waygat, $70^{\circ}16'$ (Rink, re-found 1908 by P., that year forming wide patches. On the very same spot searched in vain 1913 (P.). From here not known till Itivneq, 67° ; the var. *groenlandica* WARM. (W. & H., P. & E.); Naujarssuit in Qeqertalik fjord, $66^{\circ}45'$ (P. & E.); on the portage between Itivdlek fjord and Sondre Stromfjord, $66^{\circ}29'$ (P. & E.); Umivik at the head of Sondre Stromfjord (Jens.).

A southern type without continuous distribution in West Greenland. North of the area collected several times in the North-East Bay where the northern limit is at $70^{\circ}40'$, south of our area known from 64° and 60° — 61° .

Abundantly flowering and fructificating.

Covered by snow and ice during winter.

The variety described by WARMING (Bih. K. Sv. Vet. Ak. Handl. XII. p. 21. LANG: Conspectus Tillæg p. 260 was found again by us on the type locality. Here the main form was absent, and we did not find any transitions.

XXXIX. Gentianaceae.

A 240. *Gentiana nivalis* L.

In luxuriant herb-mats.

Disko: near Godhavn, $69^{\circ}15'$; Engelskmandens Havn near the springs (Rikli, Th. P.), at Torskenæs (Th. P.) and near the springs in Osterdalén (Th. P.).

Mainland: Nordre Stromfjord at Eqalorssuit, $67^{\circ}35'$, on both shores (E. P.); South of Sarfarssuaq, $67^{\circ}45'$ (P. & E.) portage near Sarfarssuaq (Korn.); Holsteinsborg; Praestefjeld, $66^{\circ}55'$ (W. & H.).

A distinct southern type, south of our area only observed a few times, common however, south of $61^{\circ}15'$ (Ros.). Probably often overlooked because of its diminutiveness. It is hardly observable amongst other vegetation except when the flowers are expanded in bright sunshine. The localities mentioned above are the northern limit.

Abundantly flowering and fructificating.

The habitats of the plant are covered by thick layers of snow during winter:

I 241. *Gentiana detonsa* ROTTB. Kiobenh. Selsk. Skr. p. 435. tab. I fig. 3. 1770. (*G. serrata* Gunn. Fl. Norv. 2. p. 101. 1772).

Mainland: Only once found at the head of the northern branch of Itivdlefjord, near the fishing place Aussivik, $66^{\circ}31'$, amongst isolated willow bushes near the shore, scarce (P. & E.).

A distinct southern and rare type, otherwise in Greenland only found around Igalko. In contradistinction to other species of *Gentiana*, *G. detonsa* is large flowering and very conspicuous, and therefore it cannot be overlooked.

The specimens were flowering and fructificating.

The habitat will be covered by snow during winter.

I 242. *Gentiana aurea* L.

Disko: Found in 1898 at the edge of a willow copse at the outflow of a spring, settling crusts of gypsum at $69^{\circ}33'$ N. Lat. $53^{\circ}34'$ W. Long. in Diskofjord (P.); on the same spot re-found several times (P.).

A distinct southern type, rather common at 60° — 61° , previously not found north of $61^{\circ}20'$, but without doubt often overlooked.

Abundantly flowering and fructificating.

The habitats are covered by thick layers of snow during winter.

I 243. *Gentiana tenella* ROTTB.

Mainland: In herb-mats at Orpigssuit, $68^{\circ}21'$ (Htz.); near the river to the southern branch of Sondre Stromfjord, on several spots, up to 400 m. $66^{\circ}50'$ (Jens.).

The above mentioned localities are hitherto the only known from West Greenland. In East Greenland, however, it was observed much farther to the north. A southern type.

Flowering and fructificating.

Probably the habitat is covered by snow during winter.

A

244. **Pleurogyne rotata** (L.) GRISEB.

On sandy clay near the shore as well on raised marine clays.

Mainland: Christianshaab $68^{\circ}47'$ (Rink); Egedesminde $68^{\circ}45'$ (Rink); Tasiussarssuaq, $68^{\circ}25'$ (Bg.); Nordre Stromfjord at Iputarssuaq, $67^{\circ}42'$ (P. & E.) and another place (Korn.); Itivneq, $66^{\circ}55'$ (P. & E.); Ikertôq fjord, $66^{\circ}45'$ (V.).

A southern type, south of the area found several times and becoming common between 60° — 61° (Ros.). The above mentioned localities are the northern limit.

Abundantly flowering and fructicating. In the localities seen by us it formed rather extended patches.

The habitats are covered by snow during winter.

I

245. **Menyanthes trifoliata** L.

In small lakes.

Mainland: at Tasiussarssuaq, $68^{\circ}25'$ (Bg. Bl.); Nordre Stromfjord, on the portage at Sarfarssuaq $67^{\circ}50'$ (Korn. P. & E.); Ikertôq fjord, $66^{\circ}45'$ (V.).

A distinct southern type. South of our area found several times, but always locally.

Our specimens were partially deflowered August 6, 1918, an unfavourably year. Ripe or wintered fruits were not observed. ROSEN-VINGE reports only of unripe fruits from the southmost Greenland and in the H. H. all specimens from Greenland are without fruits, whereas the plant fructificates in Iceland.

During winter the lakes will freeze to the bottom and the plants are covered by or enclosed in ice.

XL. Boraginaceae.

!

246. **Mertensia maritima** (L.) GRAY.

On sandy sea shore, hence sometimes in manured soil at some distance from the shore.

Disko and Hare Ø very common (P.).

Mainland: Common in the basaltic and sand stone districts, scarce in the gneissic, because suitable localities are restricted and local. Also observed in Nordre Stromfjord, at the mouth as well as at the head (P. & E.).

Its range in Greenland is rather remarkable and resembles that of the northern types, although the plant on both sides of the Atlantic occurs down to the shores of temperate regions. South of our area it is known in West Greenland only from two spots, viz. at $65^{\circ}20'$ and 63° and in the whole of East Greenland it was only found in 3 specimens near the settlement of Angmagssalik $65^{\circ}37'$ (K.) perhaps here as an

introduced weed. On the other hand it is common in Iceland and Jan-Mayen. The northern limit in Greenland is still unknown, but may be north of 76° .

On Disko abundantly flowering and fructifying and seedlings are found everywhere. The achenes have an air-chamber and will float a long time.

Covered by snow during winter.

XLI. Labiatae.

L 247. *Thymus Serpyllum* L. var. *prostratus* HORN.

In sandy soil amongst willows and grasses.

Mainland: Only found in the southern part of the area at Praestefjeld near Holsteinsborg $66^{\circ}55'$ (Giesecke, W. & H., P. & E.), the northern limit.

A distinct southern type, south of the area observed at $65^{\circ}10'$ common about 64° and from 62° to 60° .

Our specimens were quite sterile Aug. 6, 1914, an unfavourable year. Specimens from South Greenland are abundantly flowering and will, at least in good summers, develop fruits.

Covered by snow during winter.

XLII. Scrophulariaceae.

A 248. *Veronica alpina* L. var. *unaliaschvensis* CR. & SCHL.

(Syn. *V. villosa* Wormskj. mser., *V. Wormskjoldii* ROEM. & SCHULT., *V. alpina* var. *villosa* LANGE).

In herb-mats and willow-thickets.

Disko: South coast and Disko fjord common; Mellemfjord, northern side scarce; Nordfjord near the mouth and west coast several localities up to $70^{\circ}11'$; coast towards Waygat scarce to $69^{\circ}50'$ (P.).

Hare Ø: South coast scarce (P.).

Mainland: Near the settlement of Nûgssuaq, $70^{\circ}41'$, along the Waygat very scarce, becoming commoner in the gneissic districts south of Torsrukáatak ice-fjord and southwards, but nowhere continually distributed. For instance rare in the Archipelago of Egedesminde and surprisingly scarce in the inner parts of Nordre Strømfjord (P. & E.).

A southern type hitherto not observed north of the localities mentioned above. In our area principally a lowland plant.

Abundantly flowering and usually also fructifying.

Covered by thick layers of snow during winter. Often the snow will last long in spring.

White flowered specimens are not infrequent.

Λ 249. **Veronica fruticans** GRANTZ. (*V. saxatilis* L. fil.).

On similar spots as the preceding, but much rarer.

Disko: South Coast near Godhavn, $69^{\circ}15'$, several localities (P.), Brede Dal, $69^{\circ}18'$ (Nygaard!).

Mainland: Atá, $70^{\circ}17'$, Atanikerdluk, $70^{\circ}2'$ (Stein) S. Kangerdluarssuk 67° (W. & H.), Præstefjeld near Holsteinsborg, $66^{\circ}55'$ (W. & H., P. & E.) and probably in more localities. LANGE: Conspectus gives no special occurrences for that much rarer species.

A southern type, common in the southernmost Greenland; the above mentioned localities are the northern limit in West Greenland.

Flowering late, but rather richly, also fructificating in good seasons.

Covered by snow during winter, but only occurring where the snow layers disappear early in spring.

White flowered specimens are common.

Λ 250. **Bartschia alpina** L.

In herb-mats and thickets.

Disko: Ranging over the whole southern part of the island, on the east side to 70° and the west to north of Nordfjord, common in the south, scarcer northwards (P.).

Mainland: In the interior of Nùgssuaq peninsula (P.). From the Waygat coast at $70^{\circ}15'$ southwards, common in the districts east of Disko Bay, scarce in the archipelago of Egedesminde, common in the fjords inland from that latitude and gradually becoming commoner towards the southern limit of our area (P.).

A southern type observed, however, a few times north of our area up to $72^{\circ}4'$ (P.). In our area a lowland plant.

Abundantly flowering and fructificating. Covered by thick layers of snow, but early snowbare in spring.

Λ 251. **Euphrasia arctica** LANGE Bot. Tidskr. I. 4. p. 47

(*E. latifolia* Pursh Conf. ROSENVINGE Medd. om Grl. 15. p. 68. RBINSON & FERNALD: Gray's Manual 7. ed. p. 733).

In sunny and luxuriant herb-mats and open willow-thickets. Ordinarily only a few centimetres high and probably often overlooked.

Disko: South Coast and Disko-fjord rather common, especially near the hot springs.

Mainland: Kingigtoq, $70^{\circ}8'$ (Htz. From Torssukátak along the eastern side of Disko Bay rather common to Tasiussarssuaq (P.), not observed in the archipelago of Egedesminde (K., P. & E.), common in N. Strømfjord (P. & E.) as well as in the fjords inland from Holsteinsborg (P. & E.).

A southern type without southern limit, north of our area observed a few times in the North-East-Bay up to $71^{\circ}25'$ (P.), its known northern limit in West Greenland. In our area a lowland plant.

Abundantly flowering and fructifying, even specimens only 1 cm high will flower.

The habitats of the plant are richly covered by snow during winter.

i

252. *Pedicularis lapponica* L.

On heath and mossy bogs. Common or very common throughout our area, but never occurring in mineralic soil poor in humus.

The distribution of this species in Greenland is remarkable; south of our area it is common to about 64° and only observed twice south of that latitude (Ros.). In East Greenland it is only known between $69^{\circ}25'$ and $73^{\circ}10'$ (K.) The northern limit in West Greenland is still unknown, in the fjords at $72^{\circ}23'$ it was so commonly distributed that the northern limit hardly can be here. On the other hand the records from 76° — 83° by HART have proved to be erroneous (SIMMONS; Ellesmereland p. 34).

In our area ranging to at least 600 m above the sea.

Abundantly flowering, but very often no seeds are developed.

Covered by thick layers of snow during winter.

A

253. *Pedicularis euphrasioides* STEPH.

On somewhat humid, luxuriant heath, exceptionally observed on a gravelly slope

[Disko: Stated from Diskofjord, without special mention of locality (Sor.). Here searched for in vain through several years especially at the settlements visited in all probability by the Rev. Sørensen (P.).]

Mainland: Continually distributed from the South-East-Bay (the northern limit at $68^{\circ}45'$) at least to S. Stromfjord, $66^{\circ}30'$. This large occurrence borders on the inland ice and the species does not occur in the archipelago of Egedesminde (K., P. & E.). In the fjords, N. Stromfjord and N. Isortoq, the occurrence advances towards the mouth.

A southern type the range of which in Greenland is very remarkable. Besides from the occurrence mentioned above it is known from the fjords about 64° and from an isolated finding at $62^{\circ}5'$ (Ros.). Not found in East Greenland.

Very abundantly flowering and fructifying.

Covered by thick layers of snow during winter.

The species is perennial.

i 254. *Pedicularis flammea* L. (*P. versicolor* MEEHAN, not WAHL.).

In mossy bogs and moist places in the heath.

Very common throughout the whole area.

Widely distributed in Greenland, without southern limit; the northern limit not known, but may be north of 74° .

Occurring from the coast to at least 700 m.

Abundantly flowering and fructificating.

Covered by snow during winter.

V

255. **Pedicularis hirsuta** L.

On heath, gravelly barrens, seldom on open spots in bogs.

Very common throughout the whole area.

Widely distributed northern type, without northern limit, on the west coast not found S. of 64°.

Ranging from the sea shore up as far as ice-free land is found.

Abundantly flowering and fructificating.

Often without cover of snow during winter. The flowers are pinkish, often whitish.

V

256. **Pedicularis lanata** (WILD.) CHAM. & SCHLECHT.

In poor and open heath, often in gravelly barrens far away from other plants. When growing amongst other plants, however, the roots also of this species are provided with *haustoria*.

Very common in the northern part of the area, becoming scarcer south of Disko Bay. In N. Strømfjord it is restricted to alpine stations and northern slopes and rather scarce (P. & E). South of Holsteinborg observed several times down to Itivdlinguaq, 66°30' (P. & E.).

A northern type, without limit northwards; the above mentioned is hitherto the southmost known in West Greenland. Not found in East Greenland, the record from 66°5' by KRUUSE is erroneous. (P.).

Abundantly flowering and fructificating. The flowers are purplish-crimson, white forms are very rare. At the same locality flowering 1—2 weeks before the preceding. The large, strongly yellow-coloured roots are sometimes eaten by the natives. They have a sweet taste (from dulcite?).

Often snowless during winter.

XLIII. Lentibulariaceae.

Utricularia.

Like the species of *Callitricha* the *Utricularia*'s found in Greenland occur near the shores of small shallow lakes, but they are much rarer. During winter those lakes are frozen right down to the bottom, but they melt rather early at the shores, and in the summer the water here is warm. The hibernacula will grow out to small shoots, but because of the short summer they never attain to flowering. Like most of the

Potamogeton's of Greenland, their life-cycle is a continued development of hibernacula. All are distinct southern types.

I 257. ***Utricularia ochroleuca* HARTM.**

Mainland: Orpigssuit, $68^{\circ}40'$ (Htz.) (Perhaps also the specimens named under *U. minor* from Tasiussarssuaq may belong to this species). Otherwise only found at Ikerasak $70^{\circ}30'$ (Vh.).

I 258. ***Utricularia intermedia* HAYNE.**

New to Greenland!

Mainland: In a small lake north of the great rapids Sarfarssuaq in Nordre Stromfjord, $67^{\circ}50'$, we found amongst stems of sedges a mass-growth of an *Utricularia*. Besides the pond was filled with *Menyanthes* and *Hippuris* etc. Although the plants were quite sterile, I have nevertheless determined them to this species, not only because of the dimorphous leaves of which the bladderless ones are provided with numerous dense bristles, but especially on account of the very characteristic leaves of the hibernacula, bearing numerous bristles in bundles (see ABROMEIT Botan. Ergebn. Tab. 8, fig. 28—30).

I 259. ***Utricularia minor* L.**

Mainland: Brede Bugt north of Jakobshavn, $69^{\circ}13'$ (P.), Claushavn $69^{\circ}5'$ (Bg.), Tasiussarssuaq, $68^{\circ}25'$ (Bg. Bl.).

A . . 260. ***Pinguicula vulgaris* L.**

In herb-mats and on luxuriant humid spots in heath or open places in moss-bogs.

Disko: South coast, numerous localities around Godhavn and in Diskofjord (P.).

Mainland: Nûgssuaq peninsula, several localities near the mouth of the big valley (P.), from Paotùt, $70^{\circ}15'$ and southwards some localities (P.); east of Disko Bay rather common, especially around the Sydost Bugt (numerous collectors); not seen in the archipelago of Egedesminde (K., P. & E.); several localities in Nordre Stromfjord (P. & E.); rather common in the fjords inland from Holsteinsborg (P. & E.).

A southern type, without southern limit; north of the area found a few times in the North East Bay to about $71^{\circ}15'$ (S. H.), its northern limit in West Greenland.

Richly, but late flowering; in good summers and on favourable spots, ripe fruits are developed, at least on Disko.

Covered by thick layers of snow during winter.

XLIV. Plantaginaceae.

A 261—262. **Plantago maritima** L. and **Pl. borealis** LANGE.

By several authors for instance A. BLYTT: Botan. Notiser 1873 p. 129; JAMES M. MACOUN: Contrib. from the Herb. Geol. Surv. Canada XI. (Canad. Rec. Sc. 1897) p. 475 the plant of LANGE was considered a valid species, but as stated by L. KOLDERUP ROSENVINGE (Andet Tillæg p. 682) every distinguishing character of the plants from Greenland is variable. Therefore often transitorial forms are met with which by one character may be determined to *maritima*, by another to *borealis*. Therefore the last mentioned author only accepts *Pl. borealis* as a variety of *Pl. maritima*.

Having seen the copious material of Greenland *Plantagos* in Herb. Haun. we cannot but affirm the existence of numerous such forms. Unfortunately we have seen but little of the so-called *Pl. maritima* in the live state in Greenland, as it principally occurs south of our area and nowhere both plants together. Therefore we may leave the question of the specific value of *Pl. borealis* open to future investigations in their natural habitats or to growing experiments. As also admitted by ROSENVINGE typically developed specimens differ widely.

Pl. maritima often occurs in South Greenland on the sea shore, but also, according to ROSENVINGE in gravelly places at some distance from the shore and ascending to a considerable height. Also in pasture-land at Igaliko he saw it, eaten by cattle. We found it at the head of Nordre Strømfjord, near the shore, but especially on raised marine clays far from the shore. Also in the fjords inland from Holsteinsborg it was rather common. It is several times recorded along the Sydost Bugt, here we only saw *Pl. borealis*. The northernmost record is from the head of Pâkitsoq fjord, 69°30', here not seen by us.

Pl. borealis grows near the sea shore, ordinarily so close to the sea that it is sprayed by the surf and occurs together with the algal growth (*Ulvaceae*). Also it is met with amongst *Puccinellia*-marshes and stands manuring very well, we never saw it far from the sea or at any height over the sea. It is rather scarce on the south and north-west coast of Disko at the mouth of Nordfjord, but is probably often overlooked. On the Mainland we found it several times from the mouth of the big river on Nûgsuaq peninsula southwards, becoming more common in the gneissic area south of Torssukátak icefjord and especially on the outer coast from the archipelago of Egedesminde southwards. Also at the mouth of Nordre Strømfjord it was common, whilst *Pl. maritima* here was absent, but occurring in the interior. The outer coast near Holsteinsborg was not investigated by us. — The northern-

most locality of this form is north of our area in the Nordost Bugt at 70°47'.

Both forms are southern types, the above mentioned localities their northern limits.

They are abundantly flowering and fructifying.

Covered by snow during winter, *Pl. borealis* also by ice.

Error: The *Plantago* referred to pag. 13 in this paper should be *Pl. borealis*; *Pl. decipiens* is a species endemic in Eastern Atlantic America, different from our Greenland forms.

XLV. Caprifoliaceae.

L 263. *Linnaea borealis* L.

In open willow thickets.

Disko: On the northern shore of Diskofjord, at 69°33', found here in 1902 and later several times on the same spot (P.). The plants forms here a wide patch, ordinarily richly flowering.

Mainland: Praestefjeld near Holsteinsborg 66°55' (W. & H., P. & E.). Both times the plants here were sterile, ours were collected Aug. 1914.

From the locality in Diskofjord I collected live specimens and cultivated them on South Disko. They do not thrive as well as on the natural spots and would be overgrown by other vegetation if left to themselves. As a rule they flower sparingly every year, but neither in culture nor in nature fruits are hitherto found:

A distinct southern type, besides only found twice in the southmost Greenland, at 60°13' and 61°10'.

Covered by thick layers of snow during winter.

XLVI. Campanulaceae.

V 264. *Campanula uniflora* L.

In herb-mats, on rock-shelves, in open heath and alpine barrens, exceptionally amongst low willows.

Disko: Common, ascending to the limit of vegetation (P.). — Hare Ø (P.).

Mainland: Nûgssuaq peninsule and land east of Disko Bay common (P.). Archipelago of Egedesminde rare (K., P. & E.). Nordre Stromfjord scarce, principally on the northern slopes and on the hills, becoming rare in the interior (P. & E.). District of Holsteinsborg near the outer coast: rare, in the interior only alpine (Jens.).

A northern type, without northern limit. South of our area only observed a few times in alpine situations or descended from the mountains, on barrens.

Abundantly flowering and fructificating. Probably always covered by some snow during winter.

Varying in size, broadness of leaves etc. according to the conditions of the habitat.

i 265. **Campanula rotundifolia L.**

On similar spots as the preceding, but much more common.

Widely distributed in West Greenland, without southern limit, the northern limit may lie between 74° and 76°.

Abundantly flowering and fructificating. Probably always covered by some snow during winter.

Varying very much. Whether the Greenlandic cycle of forms of the collective species *C. rotundifolia* deserve to be united under a special name, *C. Gieseckeana* (Vest.) Witas., I cannot say. On the other hand I am inclined to suppose that the different varieties recorded from Greenland and provided with names are merely ecological forms, connected through numerous transitions. The variety *arctica* of LANGE is the normal form, occurring on somewhat favourable spots in our area. On exposed spots the plants are smaller, especially lower, whereas the corolla is as large or even larger, than on the luxuriant form from rock-shelves. On the most barren spots we find a low form also with small flowers: var. *uniflora* LANGE.

XLVII. Compositae.

V 266. **Erigeron compositus PURSH.**

On gravelly moraines and barrens, in sandy river-beds and deltas, descended from the highland.

Disko: The northern part of the Waygat coast, common (P.), in the big valleys and on the basaltic plateaus on the Northland (P.), Mellemfjord (Th. Fr.). — Hare Ø (P.).

Mainland: Nûgssuaq peninsula, common in the basaltic and sandstone area, as well near the coast as on the hills and in the big valleys (P.). South hereof not found till Claushavn, 69°5' (Bg.), Nordre Stromfjord at Eqaluuarssuit, 67°36' (P. & E.), N. Isortoq (V.), Holsteinsborg district, near the colony and especially in the interior, where it becomes rather common (P. & E.).

Without doubt a northern type, probably without northern limit. South of our area observed in the fjord-regions at 64° and 60°—61°, probably here descended from the highland.

Abundantly flowering and fructificating.

Often snowless in winter.

Erigeron species Nr. 267 to 268.

For the subsequent species of *Erigeron* we have made VIERHAPPER's well-known monograph (Beih. Bot. Centralbl. XIX Abt. II H. 3. 1906) and the supplemental observations on the northern and arctic ones by LINDMAN (Bot. Notiser 1910 p. 161 ff.) the base of our understanding and classification. VIERHAPPER has for his work made a critical revision of the specimens preserved in most of the larger museums of Europe, amongst them the material from Greenland in the H. H. In the following therefore the remarks on the geographical distribution of the species in West Greenland chiefly rest upon his work or his determinations, whereas we are responsible for the observations on the occurrence of the species on their natural habitat and on their biology, as well as for some details regarding the distribution of the various species occurring near the limits of their range.

I 267. *Erigeron unalaschkensis* (D. C.) VIERH. l. c., LINDMAN, l. c., *E. uniflorus* Lge. p. p. non L., *E. uniflorus* var. *pulchellus* FR. LANGE et Auctt. Complur de Fl. Groenl., *E. arcticus* Rouy).

In sheltered position: on herb-mats, on spots with long lasting snow.

Disko: Common in the whole of the southern part as well as in the fjords, rather common on the west coast, but scarce on the coast towards Waygat, especially on its northern part (P.). — Hare Ø (P.).

Mainland: Nùgssuaq peninsula common (P.) land east of Disko Bay rather common, becoming scarcer southwards (P.), archipelago of Egedesminde rather common (P. & E.); in the large fjords in the southern part of our area scarce, often only on the northern slopes or near the summits of the hills (P. & E.).

A northern type, south of our area observed in the Godthaab fjord at Ujaragssuit (descended from the high-land?) (S. H.) and from Jensens Nunataq, 62°40', at the altitude of 4100' (Korn.), its southern limit. The northern limit is still unknown, but may be somewhere north of 73°. At this parallel the species becomes remarkably scarcer, and from Northern Greenland and Ellesmereland it was not reported by SIMMONS.

Abundantly flowering and fructificating.

Ascending to considerable attitudes.

Covered by thick layers of snow during winter.

T 268. *Erigeron eriocephalus* J. VAHL. LINDMAN l. c.
(E. uniflorus var. or subsp. *eriocephalus*. VIERHAPPER et Auctt. Compl. sicut BERLIN, ROSENVINGE, SIMMONS, KRUUSE etc.).

In fresh morainic soil, bare clayey spots in heath, in exposed barrens, sometimes in brook-gravel and deltas, descended from the high-land.

Disko: North-east coast, rather common down to about 70° (P.). — Hare Ø (P).

Mainland: Coast of Nùgssuaq peninsula towards the Waygat rather common from 70° to $70^{\circ}45'$ (P.). Holsteinsborg $66^{\circ}55'$ (alpine?) (Htz. affirm. Vierh.).

A high-arctic type, without northern limit, the above mentioned localities are the southern limit of the species in West Greenland.

Flowers earlier than the preceding and fructificates abundantly.

Only covered by scanty layers of snow and perhaps sometimes snowbare in winter.

Where this and the preceding species are found together, e. g. on the coasts of Waygat, the differences in the colouring in the live state are very conspicuous.

A 269. **Erigeron uniflorus** L. emend. VIERH.
(*E. alpinus* var. *leucocephalus*, LANGE).

When we made our collections, we had no access to the work of VIERHAPPER and no clear knowledge of this species and its distribution. Therefore some of our field notes from the southern parts of our area, referred to *E. unalaschensis*, may perhaps belong to *E. uniflorus*. The species is in Greenland, according to the determinations of VIERHAPPER, a distinct southern type, rather common from the fjords at 64° and southwards. North hereof it has been collected at Qáumarnit Qingua, $65^{\circ}12'$ (Jens.), S. Isortoq, $65^{\circ}20'$ (Ros.) Kangerdluarssugssuaq, $66^{\circ}17'$ (Jens.), and once in Nordre Strømfjord, probably Ungôriarsfik, $67^{\circ}42'$ (Korn.). The last mentioned locality is the northern limit and the only one lying within our area.

The specimens in H. H. are flowering and fructificating.

Without doubt covered by snow during winter.

A 270. **Erigeron (Trimorpha) borealis** (VIERH.) Simmons.
(*E. alpinus* LANGE p. p. *E. neglectus* Auctt. non KERN.
E. alpinus f. *fastigiatus* Ros.).

According to the determinations of VIERHAPPER, also this species is a distinct southern type with a still more southerly distribution than the preceding. Its main occurrence in West Greenland is south of the 62° parallel. A few specimens are collected in the fjords at 64° , north hereof one specimen from Qáumarnit, $65^{\circ}12'$ (S. H.) and another damaged specimen, which cannot be determined with certainty, from N. Isortoq, $67^{\circ}10'$ (V.). If this specimen were right, it would range within our area.

Several times plants such as "E. alpinus" or "E. neglectus" have been reported from our area, up to $69^{\circ}30'$ on Disko, but according to

VIERHAPPER, all these identifications are erroneous and are not to be referred to his *E. borealis*.

I 271. **Antennaria groenlandica** PORSILD:

Medd. om Gr. 51, p. 274 tab. 6. 1915 (Syn. *A. dioica* var. *hyperborea* LANGE Consp. Fl. Groenl. p. 100; non *Gnaphalium hyperboreum* Don).

On rather dry spots, sunny herb-mats and heath (ROSENVINGE).

Mainland: Only found in the southern part of the area, Holsteinsborg, $66^{\circ}55'$ (V.); with some doubt, I also refer some plants from Ipiutarssuaq in N. Strømfjord, $67^{\circ}42'$ (P. & E.) to this species because of the snow-white obtuse involucral bracts. The rosulated leaves are shorter and relatively broader than on typical specimens.

A distinct southern type, the above mentioned localities are the northern limit. Flowers and fructificates apogamically.

Covered by snow during winter.

A 272. **Antennaria intermedia** (ROSENV.)

PORSILD: l. c. p. 278, fig. 7.

In luxuriant herb-mats and slopes. Rare, probably overlooked.

Disko: Several localities on the South coast near Godhavn $69^{\circ}15'$ (various collectors).

Mainland: Atanikerdluk, $70^{\circ}5'$ (P.); Sarqaq, 70° (V.); N. Strømfjord; Eqaluarssuit, $67^{\circ}36'$ (P. & E.); Præstefjæld near Holsteinsborg, $66^{\circ}55'$ (Th. H.); Naujarssuit in Qeqertalik-fjord $66^{\circ}44'$ (P. & E.).

Probably a southern type, south of our area occurring down to $61^{\circ}45'$.

Abundantly, but late flowering; fruits are developed apogamically in favourable seasons.

Covered by thick layers of snow during winter.

I 273. **Antennaria glabrata** (J. VAHL)

E. L. GREENE Pittonia III. p. 285. 1898. PORSILD l. c. p. 273 fig. 4.
(Syn. *A. alpina* var. *glabrata* J. VAHL).

When I in 1915 proposed this combination, I was unaware of the fact that GREENE 17 years ago had raised the same plant to the rank of a species.

In herb mats, on open spots in heath and in morainic soil.

Disko: Found in most of the investigated parts of the island, but scarce; without doubt often overlooked. Seems to be somewhat more common on the northern half than on the southern (P.). — Hare Ø (P.).

Mainland: Collected at Nügssuaq, $70^{\circ}40'$ (P.). Sarqaq, 70° (V. Htz.); Eqq $69^{\circ}40'$ (P.); South coast of Sarqardlit, $68^{\circ}40'$ (P. & E.); N. Isortoq, $67^{\circ}15'$ (V.).

The distribution of this species is still very imperfectly known, hitherto not recorded from the southmost parts of Greenland.

Abundantly flowering and apogamically fructificating.

Covered by snow during winter.

**i 274. *Antennaria alpina* (L.) GAERTN.,
PORSILD l. c. p. 269. fig. 3.**

In herb-mats, in the lowland often where snow lasts long, also in luxuriant heath or in open thickets, seldom on fresh moraines.

Disko: South coast, the fjords, the west coast and valleys leading into the interior common, on the northern part of the Waygat coast scarce (P.). Hare O. (P.).

Mainland: Rather common throughout the whole area, becoming more common southwards (P. & E.).

A widely distributed species without southern limit. The northern limit is not known, but may be north of 76°.

Ranging, from the shore as far up as dense vegetation occurs, but on the latitude of Disko principally restricted to favourable situations.

Abundantly flowering and apogamically fructificating.

Probably always covered by snow during winter.

Λ 275. *Gnaphalium supinum* L.

In herb-mats, undoubtedly often overlooked because of its diminutiveness.

Disko: South coast near Godhavn, 69°15' (several collectors); Tuaparssuit (P.); Mudderbugt 69°15' (Htz.).

Mainland: Majorqarssuatsiaq, 70°15' (Bg.); Ritenbenk and Kangeq, 69°45' (Bg.); Holsteinsborg, 66°55' (V.).

A southern type, without southern limit; the above mentioned localities are the northern limit.

In our area a lowland plant.

Abundantly flowering and fructificating.

Covered by thick layers of snow during winter.

The specimens from Disko belong to the var. *subacaule* WAHL, emend. BRAUN-BLANQUET Vierteljahrsschr. Naturf. Ges. Zürich. 62. 1917. p. 617.

Λ 276. *Gnaphalium norvegicum* GUNN.

In luxuriant herb-mats and willow-thickets.

Disko: South coast, rather common (P.); Diskofjord, not uncommon, especially on the sunny sides and in the interior (P.); Mellemfjord, at Ikorfarssuit and Sargardlit silardlit, 69°46' (P.).

A distinct southern type, on the mainland known to $65^{\circ}50'$ and common south of 64° (Ros.). The localities mentioned above may be the northern limit of the species, as some of the records by TAYLOR and HART from regions farther north have not been verified.

In our area exclusively a lowland plant.

Amongst the specimens from Mellemfjord occurs f. *viridescens* (Legr.) BRAUN-BLAQUET I. c. p. 616, which, according to my view, is a shade-form from thickets.

Gnaphalium silvaticum L. is recorded from South Disko by HART together with the preceding, but as specimens according to SIMMONS do not exist amongst his collections and as it has not been observed by other collectors in any part of Greenland, this record has to be considered an error.

Matricaria Chamomilla L. is considered by ROSENVINGE indigenous to Greenland, because the specimens collected by KORNERUP in N. Strømfjord are labelled: "near the border of the inland ice, far from the coast". They were found, however, in a district much visited for caribou-hunting and as the native hunters often take "*flores Chamomillae*" with them, as well as medicine as a substitute for tea, I shall consider the plant introduced till this record has been confirmed by more recent findings.

I

277. *Artemisia borealis* PALL.

On dry sandy or clayey slopes, on gravelly gneissic moraines, on dry river banks and deltas.

Disko: Very rare, although it is rather common on the mainland on the same latitude. Recorded from Godhavn, $69^{\circ}15'$ as collected by MARGRETE KRARUP SMITH, but as we have searched for it here in vain during many years the statement is perhaps due to some confusion of labels. — Mudderbugt $69^{\circ}43'$ (P.).

Mainland: From the Waygat coast of Nûssuaq peninsula southwards, common, often forming extensive patches, especially in the interior.

North of our area scarce, however, ranging to at least $72^{\circ}30'$ (P.), south of the area known to 63° . As the species in America and Asia also reaches down to regions with temperate climates, I should rather consider it a southern type.

Remarkable is the absence in East Greenland.

Abundantly flowering and fructificating.

Without doubt often snowbare during winter.

V

278. **Arnica alpina** (L.) OLIN.

In herb-mats and luxuriant spots in the heath and on rock shelves.

Common throughout the area, especially at some distance from the coast.

A northern type without northern limit, south of our area ranging to the fjord district at 64° (Ros.).

From the shore to considerable altitudes.

Abundantly flowering and fructificating.

Covered by snow during winter.

On sunny spots, rich in mould a luxuriant form occurs:

f. *pluriceps* HAGLUND in herb. Described but not named by ROSENVINGE: Andet Tillæg p. 701 as follows: *Ramosa, calathiis 3—5 bene evolutis; scapi laterales 1—2 foliis parvis, non oppositis muniti.*

This form was observed, for instance, at Godhavn (P.), Paotût (Th. P.), Orpigssuit (Htz.), N. Stromfjord (P. & E.).

T

279. **Taraxacum phymatocarpum** J. VAHL.

DAHLSTEDT: Studier öfver arktiska Taraxaca. Ark. f. Bot. 2. N. 8. p. 22.

In dry morainic and stony soil, on gravelly banks in river deltas.

Disko: From 70°10' on the west coast northwards and on the coast towards Waygat down to ca. 70° gathered by several collectors and rather common. Otherwise only on the top of a hill near Mudderbugt, 69°50', 875 m above the sea (P.).

Mainland: on Nûgssuaq peninsula on the west coast and the coast towards Waygat down to about 70° as well as in the big valley, rather common (P.).

Obs. Some of the specimens were determined by H. DAHLSTEDT.

A high-arctic type, the localities mentioned above are the southern limit.

Abundantly flowering and fructificating.

Probably covered by a thin layer of snow during winter.

I

280. **Taraxacum groenlandicum** DAHLSTEDT:

Arktiska och alpina arter inom formgruppen Taraxacum ceratophorum (Led.) D. C. Arkiv f. Bot. 5. N. 9. p. 23. tab. 14—15. (*T. officinale ceratophorum* LANGE pro maxima parte Conspl. fl. GrL. p. 84.)

In sandy and gravelly soil, often on downs along the shore consisting not only of quartzic but also of basaltic sand.

Disko: hardly rare, most of the localities known are on the south coast, but also observed on the north coast and in the interior (P.). — Hare Ø (P.).

Mainland: Nûgssuaq peninsula on the coast and in the big valley common (P.). From Torssukåtak southwards observed in numerous localities to the fjords inland from Holsteinsborg (P. & E.).

Obs. A few of the specimens were determined by H. DAHLSTEDT.

North of our area known to at least $72^{\circ}5'$ (Ryder), south of $66^{\circ}45'$ no findings are reported till an isolated one at 61° . Not observed in East Greenland.

In accordance with the range of the species in Greenland and Arctic America (see DAHLSTEDT) probably a northern type.

Abundantly flowering and fructifying.

Covered by snow during winter.

T 281. *Taraxacum arctogenum* DAHLST I. c. p. 27. tab. 16.

A high-arctic type, occurring north of 76° , only once observed in our area on an islet in Sydost Bugt, $68^{\circ}35'$ (Htz. det. H. DAHLSTEDT).

A 282. *Taraxacum croceum* DAHLST. coll.

Confer. H. DAHLSTEDT: Om skandinaviska Taraxacumformer. Bot. Not. 1905. *idem*: Nordsvenska Taraxaca. Ark. f. Bot. 12. N. 2. 1912.

For the present I thus denote the most common species of *Taraxacum* in our area. They occur on favourable, sheltered spots, common in the southern parts of the area and, for instance on the southern half of Disko, but scarce or absent on the northern. Thus their occurrence corresponds to that of the southern types. The northernmost point, where I have seen a representative of this group, is on the south coast of Svartenhuk peninsula $71^{\circ}25'$ (P.).

In our area at least two species occur, one more common with pale flowers and a rarer one with larger and darker heads. The last mentioned seems to be restricted to the most favourable situations in the south-most parts of the area and on South Disko. I have not tried to identify them with some of the species of the group provisionally described by DAHLSTEDT in Bot. Not., but they seem to me to be related to DAHLSTEDT's N. 2: *spectabile* and N. 3: *croceum*, which, according to the author, are known to him from Greenland.

Abundantly flowering and fructifying.

Covered by thick layers of snow during winter.

I 283. *Hieracium hyparcticum* ALMQ.

In luxuriant herb-mats and willow-thickets.

Mainland: Only observed in the southern parts of our area: N. Isortoq, $67^{\circ}15'$ (Ros.); S. Kangerdluarssuk, 67° (Ros.); Holsteinsborg, Præstefjeld, $66^{\circ}55'$ (several collectors) all determined by H. DAHLSTEDT. Naujarssuit in Qeqertalik-fjord, $66^{\circ}45'$ (P. & E.) det. by C. H. OSTENFELD.

A distinct southern type, south of the area known to 60° . The above mentioned localities are the northern limit.

Only from lowlands stations.

Abundantly flowering and fructificating.

Covered by thick layers of snow during winter.

I 284. *Hieracium groenlandicum* ALMQ.

In luxuriant herb-mats and willow-thickets.

Disko: North coast of Diskofjord at 69°33' (PORSILD & RIKLI), det. DAHLSTEDT.

Mainland: Near the mouth of N. Stromfjord, ca. 67°33' (Korn.) det. DAHLSTEDT; Holsteinsborg, Præstefjeld, 66°45' (P. & E.) and Naujarsuit, 66°45' (P. & E.) det. C. H. OSTENFELD.

A distinct southern type, the localities mentioned are the northern limit.

Only occurring in the lowland.

Abundantly flowering and fructificating.

Covered by thick layers of snow during winter.

The specimens from Diskofjord were tall and vigorous forming a patch of 20—30 flowering specimens. Some were transplanted to South Disko, where they flowered the first years, but gradually they were overpowered by other vegetation, ceased flowering and at last disappeared entirely.

I 285. *Hieracium groenlandicum* ALMQ. var. *ivigtutense* ALMQ.

Only once observed in our area, at Præstefjeld near Holsteinsborg, 66°45' (W. & H.) det. DAHLSTEDT. Otherwise not known north of 61°15'. Thus a distinct southern type.

POSTSCRIPT

WHEN in 1920 the Committee for the geological and geographical investigations of Greenland kindly undertook to publish the present work and immediately put the first part to press I hoped to be able to finish the second part during the printing of the first part. In this, however, I was hindered by various other works of official character, travels abroad etc., and later on both I and my collaborator have had occasion to make further observations in hitherto unexplored parts of the area whereby the preliminary work accomplished for the second part had to be revised. This second part will contain a survey of the distribution of the species and types of plants within the area as far as possible with due allowance to the geographical, geological and climatological conditions.

My reason for letting the first part appear before finishing the second is due to the purely practical demand that the present volume in "Meddelelser om Gronland" has to be concluded. In this connection I must express my sincerest thanks to the Committee for the unique patience shown at this delay.

MORTEN P. PORSILD.

Disko. October 1925.





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